

PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

(INSTITUTED 1852)

VOL. XL—No. 7

SEPTEMBER, 1914

Edited by the Secretary, under the direction of the Committee on Publications.

Reprints from this publication, which is copyrighted, may be made on condition that the full title of Paper, name of Author, page reference, and date of presentation to the Society, are given.

CONTENTS

Society Affairs.....	Pages 539 to 590.
Papers and Discussions.....	Pages 2099 to 2386.

NEW YORK 1914

Entered according to Act of Congress, in the year 1914, by the AMERICAN SOCIETY OF CIVIL ENGINEERS, in the office of the Librarian of Congress, at Washington.

American Society of Civil Engineers

OFFICERS FOR 1914

President, HUNTER McDONALD

Vice-Presidents

Term expires January, 1915:

J. WALDO SMITH
CHARLES H. RUST

Term expires January, 1916:

CHARLES F. LOWETH
GARDNER S. WILLIAMS

Secretary, CHARLES WARREN HUNT

Treasurer, JOHN F. WALLACE

Directors

Term expires January, 1915:

LINCOLN BUSH
T. KENNARD THOMSON
*ROBERT A. CUMMINGS
WILLIAM CAIN
E. C. LEWIS
W. A. CATTELL

Term expires January, 1916:

JAMES H. EDWARDS
HENRY W. HODGE
LEONARD METCALF
HENRY R. LEONARD
EDWARD H. CONNOR
SAMUEL H. HEDGES

Term expires January, 1917:

GEORGE W. FULLER
ARTHUR S. TUTTLE
CHARLES H. KEEFER
MORTIMER E. COOLEY
EUGENE E. HASKELL
RICHARD MONTFORT

Assistant Secretary, T. J. MCMINN

Standing Committees

(THE PRESIDENT OF THE SOCIETY IS *ex-officio* MEMBER OF ALL COMMITTEES)

On Finance:

LINCOLN BUSH
HENRY W. HODGE
LEONARD METCALF
*ROBERT A. CUMMINGS
GEORGE W. FULLER

On Publications:

JAMES H. EDWARDS
WILLIAM CAIN
ARTHUR S. TUTTLE
HENRY R. LEONARD
GARDNER S. WILLIAMS

On Library:

J. WALDO SMITH
T. KENNARD THOMSON
E. C. LEWIS
M. E. COOLEY
CHAS. WARREN HUNT

Special Committees

ON CONCRETE AND REINFORCED CONCRETE: Joseph R. Worcester, J. E. Greiner, W. K. Hatt, Olaf Hoff, Richard L. Humphrey, Robert W. Lesley, Emil Swensson, A. N. Talbot.

ON ENGINEERING EDUCATION: Desmond FitzGerald, Onward Bates, D. W. Mead.

ON STEEL COLUMNS AND TRUITS: Austin L. Bowman, James H. Edwards, Charles F. Loweth, Rudolph P. Miller, Ralph Modjeski, Frank C. Osborn, George H. Pegram, Lewis D. Rights, George F. Swain, Emil Swensson, Joseph R. Worcester.

ON MATERIALS FOR ROAD CONSTRUCTION: W. W. Crosby, A. W. Dean, H. K. Bishop, A. H. Blanchard, George W. Tillson, Nelson P. Lewis, Charles J. Tilden.

ON VALUATION OF PUBLIC UTILITIES: Frederic P. Stearns, Charles S. Churchill, Leonard Metcalf, William G. Raymond, Henry E. Riggs, Jonathan P. Snow, William J. Willgus.

TO INVESTIGATE CONDITIONS OF EMPLOYMENT OF, AND COMPENSATION OF, CIVIL ENGINEERS: Nelson P. Lewis, S. L. F. Deyo, Dugald C. Jackson, William V. Judson, George W. Tillson, C. F. Loweth, John A. Bensel.

TO CODIFY PRESENT PRACTICE ON THE BEARING VALUE OF SOILS FOR FOUNDATIONS, ETC.: Robert A. Cummings, Edward C. Shankland, Edwin Duryea, Jr., James C. Meem, Walter J. Douglas, Samuel T. Wagner, Frank M. Kerr.

ON A NATIONAL WATER LAW: F. H. Newell, George G. Anderson, Charles W. Comstock, Clemens Herschel, W. C. Hoad, Robert E. Horton, John H. Lewis, Charles D. Marx, Gardner S. Williams.

ON FLOODS AND FLOOD PREVENTION: C. McD. Townsend, John A. Bensel, T. G. Dabney, C. E. Grunsky, Frank M. Kerr, Morris Knowles, J. B. Lippincott, Daniel W. Mead, John A. Ockerson, Arthur T. Safford, Charles Saville, F. L. Sellev.

TO REPORT ON STRESSES IN RAILROAD TRACK: A. N. Talbot, A. S. Baldwin, J. B. Berry, G. H. Bremner, John Brunner, W. J. Burton, Charles S. Churchill, W. C. Cushing, Robert W. Hunt, George W. Kittredge, C. G. E. Larsson, William McNab, G. J. Ray, F. E. Turneure, J. E. Willoughby.

The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.

CABLE ADDRESS....."Ceas, New York."

*Elected to fill the vacancy caused by the death of Emil Gerber, Director, on April 16th, 1914.

AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed
in its publications.

SOCIETY AFFAIRS

CONTENTS

	Page
Minutes of Meetings:	
Of the Society, September 2d, 1914.....	539
Of the Board of Direction, September 2d, 1914.....	545
Announcements:	
Hours during which the Society House is open.....	546
Future Meetings.....	546
Searches in the Library.....	546
Papers and Discussions.....	547
Local Associations of Members of the American Society of Civil Engineers.....	547
Privileges of Engineering Societies Extended to Members.....	549
Accessions to the Library:	
Donations.....	552
By purchase.....	554
Membership (Additions, Changes of Address, Expulsions, Deaths).....	556
Recent Engineering Articles of Interest.....	560

MINUTES OF MEETINGS OF THE SOCIETY

September 2d, 1914.—The meeting was called to order at 8.30 P. M.; Vice-President Gardner S. Williams in the chair; Chas. Warren Hunt, Secretary; and present, also, 64 members and 5 guests.

The minutes of the meetings of May 20th and of the Annual Convention were approved as printed in *Proceedings* for August, 1914.

A paper by Clarence T. Johnston, M. Am. Soc. C. E., entitled "Some Principles Relating to the Administration of Streams," was presented by the Secretary, who also read a communication on the subject from Herbert E. Bellamy, Assoc. M. Am. Soc. C. E.

A paper by W. W. Edwards, Assoc. M. Am. Soc. C. E., entitled "The Construction of the Klondike Pipe Line," was presented by the Secretary, who also presented communications on the subject from Messrs. G. B. Pillsbury and Walter S. Wheeler.

Messrs. J. H. Gandolfo, A. H. Van Cleve, and J. H. Granbery were appointed Tellers to canvass the ballot on the following proposed Code of Ethics:

"It shall be considered unprofessional and inconsistent with honorable and dignified bearing for any member of the American Society of Civil Engineers:

"1. To act for his clients in professional matters otherwise than as a faithful agent or trustee, or to accept any remuneration other than his stated charges for services rendered his clients.

"2. To attempt to injure falsely or maliciously, directly or indirectly, the professional reputation, prospects, or business, of another Engineer.

"3. To attempt to supplant another Engineer after definite steps have been taken toward his employment.

"4. To compete with another Engineer for employment on the basis of professional charges, by reducing his usual charges and in this manner attempting to underbid after being informed of the charges named by another.

"5. To review the work of another Engineer for the same client, except with the knowledge or consent of such Engineer, or unless the connection of such Engineer with the work has been terminated.

"6. To advertise in self-laudatory language, or in any other manner derogatory to the dignity of the Profession."

The Tellers reported as follows:

Total number of ballots received.....	2 316
Ballot in duplicate.....	1
Ballots from deceased members.....	2
Ballots in envelopes stamped, not signed.....	12
Ballots in envelopes not signed, or otherwise irregular.....	19
Ballots from members in arrears of dues.....	120 154
Ballots to be canvassed.....	2 162
Total affirmative votes	1 997
Negative votes.....	107
Blank	24
Modified	34
	2 162

J. H. GANDOLFO,

A. H. VAN CLEVE,

J. H. GRANBERY.

The Chair declared the Code of Ethics adopted by the Society.

The Secretary announced the following deaths:

BENJAMIN THOMAS BUFFINTON, of Fall River, Mass., elected Associate Member, September 7th, 1904; Member, January 3d, 1907; died July 6th, 1914.

HORACE CROSBY, of New Rochelle, N. Y., elected Member, February 17th, 1869; died July 24th, 1914.

MARTIN LUTHER GARDNER, of New York City, elected Associate Member, September 2d, 1891; Member, March 4th, 1896; died May 14th, 1914.

JUSTUS HERBERT GRANT, of Rochester, N. Y., elected Member, March 2d, 1892; died August 1st, 1914.

HURD CLARENCE HURD, of North Beach, Md., elected Member, July 2d, 1913; died July 8th, 1914.

FRANK PARSONS LANT, of New York City, elected Junior, October 3d, 1888; Member, February 1st, 1910; died June 30th, 1914.

DICKINSON MACALLISTER, of Fort Hunter, Pa., elected Member, April 1st, 1896; died July 31st, 1914.

HENRY LEWIS OESTREICH, of Brooklyn, N. Y., elected Junior, October 4th, 1892; Associate Member, December 6th, 1899; Member, April 6th, 1909; died August 13th, 1914.

GEORGE JOHN COUCHOT, of San Francisco, Cal., elected Associate Member, May 3d, 1910; died May 3d, 1914.

JESSE SIDWELL MATSON, of Ashtabula, Ohio, elected Associate Member, July 1st, 1908; died July 4th, 1914.

JOHN MARVIN PETERS, of McKeesport, Pa., elected Junior, May 1st, 1906; Associate Member, November 1st, 1910; died July 21st, 1914.

PHILIP MORRIS PRITCHARD, of Widnes, Lancashire, England, elected Associate Member, June 6th, 1900; died July 8th, 1914.

WILLIAM DE HERTBURNE WASHINGTON, of New York City, elected Associate Member, October 5th, 1892; died August 30th, 1914.

WARREN AUSTIN GATES, of Oklahoma, Okla., elected Junior, June 30th, 1911; died May 24th, 1914.

The Secretary announced the election of the following candidates on September 2d, 1914:

AS MEMBERS

WILLIAM GEORGE ADDIS, Winthrop, Mass.

JUSTIN KENDERDINE ANDERSON, Charleston, W. Va.

CHARLES KENNARD BOWEN, Los Angeles, Cal.

HENRY CYRILLE BREIDERT, Chicago, Ill.

MELVILLE FISK CLEMENTS, Ridgefield, Wash.

EDWARD MIALl DURHAM, JR., Atlanta, Ga.

FRANK HENRY FELLER, Spokane, Wash.

KIRBY SCOTT HECK, Manila, Philippine Islands

ALEXANDER WILLIAM MACCALLUM, Philadelphia, Pa.

JOHN WILLIAM MUSHAM, Chicago, Ill.

JOSEPH HENRY PRIOR, Chicago, Ill.
 CHARLES SWIFT RICHÉ, Galveston, Tex.
 OTIS FLETCHER ROWLAND, Albany, N. Y.
 HARRY EDGAR SAWTELL, Winthrop, Mass.
 CHARLES HENRY SPENCER, Washington, D. C.
 EDWARD GRAY TABER, Spokane, Wash.
 WILLIAM CHASE THOMSON, Montreal, Que., Canada

AS ASSOCIATE MEMBERS

PERCY LYONS ABRAHAM, Kingston, Jamaica
 LANGFORD TAYLOR ALDEN, San Francisco, Cal.
 DAVID HAWLEY ASHTON, Salt Lake City, Utah
 GEORGE EVERETT BAKER, Whitehall, Mont.
 PAUL LEONARD BEAN, Orono, Me.
 WALTER CHRISTMAS BODYCOMB, Winnipeg, Man., Canada
 ARCHIBALD ALEXANDER BROWN, Oakland, Cal.
 GEORGE ROBERT URE BUCHANAN, Ensenada de Mora, Cuba
 JOHN BOW CHALLIES, Ottawa, Ont., Canada
 CHARLES BROWN CORNELL, Kent, Ohio
 ERNEST BUCHANAN CRANE, Seattle, Wash.
 PETER FRANCIS DALY, North Bergen, N. J.
 EDWARD CHARLES DAVIS, St. Louis, Mo.
 DONALD DERICKSON, New Orleans, La.
 RUMLEY DEWITT, Troy, N. Y.
 GEORGE HENRY ELLIS, Powell, Wyo.
 OLNEY NORMAN FOOTE, Buffalo, N. Y.
 WATSON GILBERT HARMON, Detroit, Mich.
 WILLIAM CHAFFIN HOWE, Worcester, Mass.
 LEO HUDSON, Pittsburgh, Pa.
 LEONARD CROUCH JORDAN, Brooklyn, N. Y.
 CHARLES H KNOWLES, Manila, Philippine Islands
 JOHN EDWARD AUGUST LINDERS, Cleveland, Ohio
 JAMES LOGAN, Mt. Holly, N. J.
 GEORGE CORPENING LOVE, Saginaw, N. C.
 PAUL WARDLAW MACK, New York City
 JAMES BROWNSON McCLAIN, Wilmington, N. C.
 GURDON SALTONSTALL MUMFORD, New York City
 EDWARD THEOBALD MURPHY, Boston, Mass.
 HERBERT NUNN, El Paso, Tex.
 HERBERT OSBORNE, Hope, B. C., Canada
 LEON FRIEND PECK, Hartford, Conn.
 HERBERT LUTHER PRINGLE, Santa Marta, Colombia
 JOHN BURKE REDDICK, San Francisco, Cal.
 CHARLES HERMAN RUGGLES, West Palm Beach, Fla.
 DANIEL ROLLAND SCHÖCK, Potsdam, N. Y.

ALFRED GEORGE SCHUTT, Detroit, Mich.
SAMUEL OSBORNE SCUDDER, West Philadelphia, Pa.
GEORGE AUSTIN SHERRON, Norwalk, Conn.
RAYMOND SICKLES, Seneca Falls, N. Y.
JOSEPH WARREN SILLIMAN, Philadelphia, Pa.
LONDON GARLAND SMITH, Tupelo, Miss.
ARTHUR VALL SPINOSA, Pittsburgh, Pa.
JOHN CHARLES KEITH STUART, Montreal, Que., Canada
DOUGLAS BARLOW TURNER, St. Louis, Mo.
EPHRAIM MARTIN VAIL, Plainfield, N. J.
JOHN HYNDS WEIDMAN, Syracuse, N. Y.
FERDINAND JACOB FREDERICK WEINERT, Richmond Heights, Mo.
ROGER AUSTIN WILSON, Corozal, Canal Zone, Panama
ROLLEN JOE WINDROW, Waco, Tex.
FRANCIS GERMAN WRIGHTSON, Jr., Sacramento, Cal.

AS ASSOCIATES

JAMES MARTIN, Colfax, Cal.
WILLARD ADELBERT SMITH, Chicago, Ill.

AS JUNIORS

ALBERT MANGUM ALEXANDER, Memphis, Tenn.
RAY LESTER ALLIN, Pasadena, Cal.
FRANK LOUIS BEAL, Stamps, Ark.
KARL MCCORTLE COSGROVE, Cambridge, Ohio
BENJAMIN JOHN CURTIS, Minneapolis, Minn.
HENRY HORTENSUS GEORGE, 3d, Whitney, N. C.
LOUIS RICHARD GONS, Baltimore, Md.
EDWARD CRITTENDEN HARDING, Jr., Cincinnati, Ohio
GEORGE WILLIAM HAWLEY, Escalon, Cal.
MAURICE WILLIAM HEWETT, Malta, Mont.
CLARENCE STRAIN JONES, Leavenworth, Kans.
JOSEPH OLIVER KINGSLEY, Santa Ysabel, Cal.
CARL HARMAN KNOETTGE, Denver, Colo.
FRANK KRISTAL, Ann Arbor, Mich.
HARRY DOUGLAS LOVERING, St. Paul, Minn.
LLOYD MCENTIRE, Frenchtown, N. J.
ELBERT HUME REIDPATH, Buffalo, N. Y.
GEORGE WILLIAM RICHARDS, Harrisburg, Pa.
HAROLD HERSMAN SCOTT, St. Louis, Mo.
CHARLES BACH SEIB, Hudson, N. Y.
JOHN ZADOK STREET, Browning, Mont.
EDWARD MAYO TOLMAN, Baltimore, Md.

MAURICE ANDERSON WEBSTER, Philadelphia, Pa.

CHARLES MALLORY WHELAN, Portland, Ore.

BERNON TISDALE WOODLE, Philadelphia, Pa.

The Secretary announced the transfer of the following candidates on September 2d, 1914:

FROM ASSOCIATE MEMBER TO MEMBER

KAY ALEXANDER, Revelstoke, B. C., Canada

ALEXANDER CONN BEESON, Washington, Pa.

CHARLES DAVIS DREW, London, E. C., England

LARS RASMUS JORGENSEN, San Francisco, Cal.

CHARLES WILLIAM McMEEKIN, Nevada City, Cal.

FREDERICK MEARS, Seattle, Wash.

ROBERT BROOKS MORSE, Baltimore, Md.

CHARLES WALTER PALMER, Philadelphia, Pa.

HARRY CHITTENDEN VENSANO, San Francisco, Cal.

FROM JUNIOR TO ASSOCIATE MEMBER

FREDERICK WEBBER AMADON, New Haven, Conn.

GEORGE ERLE BEGGS, Princeton, N. J.

SIDNEY RAYMOND BELLOW, New York City

OTTO GEORGE HENRY BUETTNER, New York City

HERBERT CRAM ELLIS, White Plains, N. Y.

HORACE SETH GRISWOLD, Berkeley, Cal.

WILLIAM EDWARD HAMILTON, Cohoes, N. Y.

RICHARDSON HAND, Wilkes-Barre, Pa.

MANTON HANNAH, Paris, Tex.

DANIEL HUBBARD, Baltimore, Md.

HOWARD CAMBERNE KIRKWOOD, Flushing, N. Y.

EUGEN FREDERICK KRIEGSMAN, San Francisco, Cal.

CLARENCE EDWARD LONG, Pittsburgh, Pa.

DONALD DOUGLAS PRICE, Lincoln, Nebr.

ARTHUR RICHARDS, Kennett, Mo.

GEORGE CORLISS SEE, Temple, Tex.

HUGO CONRAD SOEST, New York City

LOUIS WACHTEL, Speculator, N. Y.

RUSSELL SHERWOOD WISE, Passaic, N. J.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

September 2d, 1914.—The Board met at 3.30 p. m.; Vice-President Smith in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bates, Bush, Cummings, Edwards, Endicott, Loweth, Montfort, Ockerson, Thomson, Tuttle, and Williams.

The Constitution of the Baltimore Association of Members of the American Society of Civil Engineers was approved.

Five Members, 14 Associate Members, 2 Associates, and 5 Juniors, were dropped for non-payment of dues.

The resignations of 2 Associate Members and 2 Juniors were accepted.

Ballots for membership were canvassed, resulting in the election of 17 Members, 51 Associate Members, 2 Associates, and 25 Juniors, and the transfer of 19 Juniors to the grade of Associate Member.

Nine Associate Members were transferred to the grade of Member.

Applications for membership were considered and other routine business transacted.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

October 7th, 1914.—8.30 P. M.—This will be a regular business meeting. Two papers will be presented for discussion, as follows: "External Corrosion of Cast-Iron Pipe", by Marshall R. Pugh, M. Am. Soc. C. E.; and "A Method of Determining Storm-Water Run-Off", by Charles B. Buerger, M. Am. Soc. C. E.

These papers were printed in *Proceedings* for August, 1914.

October 21st, 1914.—8.30 P. M.—At this meeting two papers will be presented for discussion, as follows: "The Design and Construction of Four Reinforced Concrete Viaducts at Fort Worth, Texas", by S. W. Bowen, M. Am. Soc. C. E.; and "The Clarification of Sewage by Fine Screens", by Kenneth Allen, M. Am. Soc. C. E.

These papers were printed in *Proceedings* for August, 1914.

November 4th, 1914.—8.30 P. M.—A regular business meeting will be held, and two papers will be presented for discussion, as follows: "Water Supply of the San Francisco-Oakland Metropolitan District", by H. T. Cory, M. Am. Soc. C. E.; and "The Lock 12 Development of the Alabama Power Company, Coosa River, Alabama", by E. L. Sayers and A. C. Polk, Members, Am. Soc. C. E.

These papers are printed in this number of *Proceedings*.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 p. m., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospi-

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

tality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Roger W. Toll, Assoc. M. Am. Soc. C. E., 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, at 12.30 p. m., at the Colorado Electric Club.

Visiting members are urged to attend the meetings and luncheons.

Atlanta Association

The Atlanta Association of Members of the American Society of Civil Engineers was organized on March 14th, 1912. The Association holds its meetings at the University Club.

At the meeting of the Association on December 29th, 1913, the new Chairman, John Ruddle, M. Am. Soc. C. E., was installed, and Messrs. Park A. Dallis and G. R. Solomon were appointed members of the Executive Committee. T. P. Branch, Assoc. M. Am. Soc. C. E., was elected Secretary.

Baltimore Association

On May 6th, 1914, the Baltimore Association of Members of the American Society of Civil Engineers was organized, a Constitution adopted, and the following officers were elected: J. E. Greiner, President; Francis Lee Stuart, First Vice-President; L. H. Beach, Second Vice-President; Harry D. Williar, Jr., Secretary-Treasurer; and Messrs. H. D. Bush, B. T. Fendall, B. P. Harrison, Calvin W. Hendrick, Oscar F. Lackey, M. A. Long, and A. A. Thompson, Directors.

At its meeting of September 2d, 1914, the Board of Direction considered and approved the proposed Constitution of the Baltimore Association of Members of the American Society of Civil Engineers.

Louisiana Association

The Louisiana Association of Members of the American Society of Civil Engineers, has been organized with the following officers: Frank M. Kerr, President; J. F. Coleman and W. B. Gregory, Vice-Presidents; A. M. N. Blamphin, Treasurer; and L. C. Datz, Secretary.

Philadelphia Association

On December 22d, 1913, the Philadelphia Association of Members of the American Society of Civil Engineers was organized with the following officers: George S. Webster, President; Richard L. Humphrey and F. Herbert Snow, Vice-Presidents; John Sterling Deans, J. W. Ledoux, Edgar Marburg, and H. S. Smith, Directors; S. M. Swaab, Treasurer; and W. L. Stevenson, Secretary. The meetings of the Association will be held at the Engineers' Club of Philadelphia, 1317 Spruce Street.

Portland, Ore., Association

On June 18th, 1913, the Portland, Ore., Association of Members of the American Society of Civil Engineers was organized with the following officers: E. G. Hopson, President; W. S. Turner, First Vice-President; D. D. Clarke, Second Vice-President; G. B. Hegardt, Treasurer; and Charles J. McGonigle, Secretary.

Seattle Association

At the Annual Meeting of the Association, held on January 26th, 1914, the following officers were elected for the ensuing year: Ernest B. Hussey, President; A. H. Fuller, Vice-President; and Carl H. Reeves, Secretary-Treasurer.

Southern California Association

The Southern California Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, on the second Wednesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained from the Secretary of the Association, W. K. Barnard, M. Am. Soc. C. E., 514 Central Building, Los Angeles, Cal.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in Los Angeles, and any such member will be gladly welcomed as a guest at any of the meetings or luncheons.

Spokane Association

At its meeting of March 4th, 1914, the Board of Direction considered and approved the proposed Constitution of the Spokane Association of Members of the American Society of Civil Engineers.

The following officers have been elected: President, C. S. MacCalla; Vice-President, U. B. Hough; Second Vice-President, Morton Macartney; Secretary-Treasurer, A. D. Butler.

Texas Association

At its meeting of December 31st, 1913, the Board of Direction considered and approved the proposed Constitution of the Texas Association of Members of the American Society of Civil Engineers.

PRIVILEGES OF ENGINEERING SOCIETIES**EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

**American Institute of Mining Engineers, 29 West Thirty-ninth Street,
New York City.**

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Engineers and Architects Club of Louisville, 1412 Starks Building, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 415 Washington Avenue, Scranton, Pa.

Engineers' Society of Pennsylvania, 31 South Front Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Calle 25 de Mayo 195, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, Room 6, City Bank and Trust Company Building, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

**Midland Institute of Mining, Civil and Mechanical Engineers,
Sheffield, England.**

Montana Society of Engineers, Butte, Mont.

**North of England Institute of Mining and Mechanical Engineers,
Newcastle-upon-Tyne, England.**

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Oregon Society of Civil Engineers, 605 Spalding Building, Portland, Ore.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Société des Ingénieurs Civils de France, 19 rue Blanche, Paris, France.

**Society of Engineers, 17 Victoria Street, Westminster, S. W.,
London, England.**

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18-1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From July 31st to September 1st, 1914)

DONATIONS*

SYMMETRICAL MASONRY ARCHES.

Including Natural Stone, Plain-Concrete, and Reinforced-Concrete Arches, for the Use of Technical Schools, Engineers, and Computers in Designing Arches According to the Elastic Theory. By Malverd A. Howe, M. Am. Soc. C. E. Second Edition, Revised and Enlarged. Cloth, $9\frac{1}{2} \times 6\frac{1}{2}$ in., illus., 24 + 245 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1914. \$2.50. (Donated by the Author.)

The preface states that the object of this book is to present in simple form the method to be used in the design of masonry arches according to the elastic theory. In this, the second edition, the errors found in the first edition are stated to have been corrected and the demonstrations of the formulas to have been simplified. The greater portion of the book is devoted, it is said, to the solution of examples, each step being given in detail so as to be easily followed by the undergraduate or engineer. In general, the unit-load method has been used in solving the problems, as this, the author states, is the only satisfactory method to use if maximum stresses are desired. In Article 89 of Chapter IV, is given a method by which the effects of certain fields of loading can be found directly. In Table II of Appendix A, data are given for about 600 masonry arch bridges arranged by span. Appendix B contains a series of arch coefficients and an example illustrating their uses in transforming a given arch to one having different dimensions, and the latest knowledge concerning the maximum range of temperature in concrete arch rings is given in Appendix E. The Contents are: Fundamental Formulas; Symmetrical Arches Fixed at the Ends; Examples Showing the Application of the Formulas, etc.; Typical Arches; Appendices; Index.

INFLUENCE DIAGRAMS

For the Determination of Maximum Moments in Trusses and Beams. By Malverd A. Howe, M. Am. Soc. C. E. Cloth, $9\frac{1}{2} \times 6$ in., illus., 8 + 65 pp. New York, John Wiley & Sons, Inc.; London, Chapman & Hall, Limited, 1914. \$1.25. (Donated by the Author.)

In this book, the author defines an influence diagram as "one which shows the effect of a unit load moving across a structure upon any function of the structure for any position of the load," and after giving a single, simple rule for drawing influence diagrams for bending moments for loads on ordinary trusses, he shows how that same rule may be applied for loads on continuous trusses, cantilever trusses, and arches. In addition, the author explains that while influence lines are usually constructed for the determination of maximum moments, they can also be easily drawn for stresses or even areas of truss members. Their use in the determination of criterions for the positions of wheel loads which produce maximums is also described and shown, it is stated, to be very simple. The Chapter headings are: Simple Trusses; Double Intersection Trusses; Continuous Trusses; Arches; Beams of Constant Cross-Section.

THE IRON ORES OF LAKE SUPERIOR

Containing Some Facts of Interest Relating to Mining and Shipping of the Ore and Location of Principal Mines; with Original Maps of the Ranges. By Crowell & Murray. Second Edition. Cloth, $9\frac{1}{2} \times 6$ in., illus., 257 + 5 pp. Cleveland, Ohio, The Pentor Publishing Company, 1914. \$3.50.

Most of the subject-matter contained in this book, it is stated, is a compilation of information relating to the iron ores of the Lake Superior region which has appeared in the various trade journals, geological reports, and transactions of scientific societies. For this, the second edition, the authors have re-drawn all the maps and re-written much of the general matter. Descriptions of the geology

* Unless otherwise specified, books in this list have been donated by the publishers.

and mineralogy of the region and the various iron ores are included, as well as of methods of mining, transportation, docks and dock machinery, and methods of sampling, concentrating and analyses of ores used in the region. In Chapter X, the authors have given, it is stated, the locations and latest descriptions of mines in the different ranges, together with names of operating companies, managers, sales agents, tables of yearly shipments and analyses of ores. The index contains the name of each mine and ore referred to and the range to which it belongs. The Chapter headings are: The Early History of the Region; Geology; Mineralogy; Production of Ore; Dock Equipment; Classification of Ores; Beneficiation of Ores; Methods of Analyses; Fuel Engineering; Location and Description of Mines; Index.

BROWN'S DIRECTORY OF AMERICAN GAS COMPANIES:

Gas Statistics, 1914. Compiled and Corrected Annually by E. C. Brown. Twenty-seventh Annual Edition. Cloth, 10½ x 7 in., 819 + 53 pp. New York, "The Gas Age", 1914. \$5.00.

As stated in the title, this book contains gas statistics of many cities and towns in the United States, Canada, Mexico, the West Indies, and the Philippine Islands. The subject-matter is arranged alphabetically by States and cities, under the following classifications: Manufactured or artificial gas companies, natural gas companies, acetylene town plants, gasoline town plants, parent or operating companies, and an appendix which contains the financial data of the companies. Under each company is given the names of railroads and steamboat lines on which the place is located, as well as those of express companies delivering to that point, officers, process of manufacture, capacity of gas-holder, number of consumers, price, etc., of both the gas and electrical departments. The names and addresses of officers of the various public service commissions having jurisdiction over gas and electric companies are also given, as well as the officers, directors and committees of the different gas associations, together with an alphabetical list of members of such associations. There is also a company index and a city and town index, and a short list of books which have been found of value by gas engineers.

Gifts have also been received from the following:

- | | |
|--|---|
| Aldershot Gas, Water & Dist. Lighting Co. 1 pam. | Gloucester, Mass.-Board of Water Commrs. 1 pam. |
| Arizona-Corporation Comm. 1 bound vol. | Graf, Otto. 2 pam. |
| Assoc. of Transportation and Car Accounting Officers. 1 vol. | Great Britain-Mersey and Irwell Joint Comm. 1 pam. |
| Atlantic Deeper Waterways Assoc. 5 bound vol., 1 vol., 11 pam. | Hall Signal Co. 1 bound vol., 1 pam. |
| Augusta, Ga.-City Council. 1 pam. | Harrison, Fairfax. 1 pam. |
| Ayer, Fred. E. 1 pam. | Hartford, Conn.-City Clerk. 1 bound vol. |
| Bellamy, Herbert E. 6 pam. | Horton, Robert E. 1 pam. |
| Bihtar and Orissa, India-Public Works Dept. 1 vol. | Idaho, Univ. of. 1 vol. |
| Bombay, India-Public Works Dept. 1 bound vol. | Illinois-Secy. of State. 1 pam. |
| Buffalo, Rochester & Pittsburgh Ry. Co. 1 pam. | Illinois-State Board of Equalization. 1 bound vol. |
| Bureau of Ry. Economics. 9 pam. | Illinois-State Geol. Survey. 1 pam. |
| Bush Terminal Co. 2 pam. | Illinois-State Public Utilities Comm. 1 pam. |
| California-R. R. Comm. 1 bound vol. | Illinois Steel Co. 1 pam. |
| California-State Board of Forestry. 2 pam. | Indiana-Public Service Comm. 2 pam. |
| California-State Board of Health. 1 pam. | Inst. of Industrial Research. 7 pam. |
| California-State Reclamation Board. 1 pam. | Inst. of Marine Engrs. 1 bound vol. |
| California-Supt. of Public Instruction. 2 pam. | Institution of Engrs. of the River Plate. 1 pam. |
| Canada-Dept. of Rys. and Canals. 2 vol., 10 maps. | Inter. Ry. Fuel Assoc. 1 vol. |
| Canadian Min. Inst. 1 pam. | Iowa-Executive Council. 1 pam. |
| Chicago, Ill.-City Waste Comm. 1 pam. | Kansas-Public Utilities Comm. 1 pam. |
| Clarksburg, W. Va.-Water Supply and Sewerage Board. 1 pam. | Kansas-State Board of Health. 5 pam. |
| Connecticut-Public Utilities Comm. 1 pam. | Lehigh Valley R. R. Co. 2 pam. |
| Cosculleula, J. A. 1 pam. | Louisiana-State Board of Equalization. 1 pam. |
| Dooling, Peter J. 36 pam. | Louisiana State Univ. 1 vol. |
| Fox, John A. 1 vol. | Lynchburg, Va.-City Clerk. 1 vol. |
| Franklin Coll. 1 pam. | McGee, Guy C. 1 bound vol. |
| | Madison, Wis.-Board of Water Commrs. 1 pam. |
| | Maine-State Water Storage Comm. 1 bound vol. |
| | Maine, Univ. of. 1 vol., 1 pam. |
| | Massachusetts-Board of Gas and Elec. Light Commrs. 1 vol. |

- Massachusetts-Highway Comm. 1 bound vol.
 Massachusetts-Public Service Comm. 1 bound vol.
 Mead, Elwood. 1 pam.
 Melrose, Mass.-Supt. of Public Works. 1 pam.
 Memphis, Tenn.-Artesian Water Dept. 1 pam.
 Michigan Geol. and Biological Soc. 2 bound vol.
 Minnesota-R. R. and Warehouse Comm. 1 bound vol.
 Mississippi-Agri. Exper. Station. 2 pam.
 Missouri-Bureau of Mines, Min., and Mine Inspection. 1 pam.
 Missouri-Public Service Comm. 1 bound vol., 1 vol.
 National Fire Protection Assoc. 1 pam.
 Nelson, Knute. 2 pam.
 New Hampshire-Public Service Comm. 1 pam.
 New Jersey-Comptroller of the Treasury. 2 bound vol.
 New South Wales-Board of Water Supply and Sewerage. 1 pam.
 New York City-Board of Water Supply. 1 bound vol.
 New York City-Comptroller. 1 pam.
 New York State-Comms. of the Palisades Interstate Park. 4 pam.
 New York State-Dept. of Labor. 2 bound vol., 3 pam.
 New York State-Public Service Comm., First Dist. 1 bound vol.
 New York-State Engr. and Surv. 1 bound vol.
 New York City Record. 2 vol.
 New York Univ. 1 pam.
 Newcastle-upon-Tyne, England-City Engr. 1 pam.
 North Carolina-Geol. and Economic Survey. 1 pam.
 O'Gorman, James A. 1 vol.
 Ohio-Industrial Comm. 1 pam.
 Ohio-State Fire Marshal. 1 pam.
 Ohio State Univ. 11 pam.
 Oklahoma-Geol. Survey. 1 pam.
 Ontario, Canada-Dept. of Public Works. 1 bound vol.
 Pennsylvania-Public Service Comm. 1 bound vol., 9 pam.
 Pennsylvania-State Highway Dept. 1 pam.
 Pennsylvania-Topographic and Geologic Survey. 1 bound vol., 1 pam., 1 map.
 Permanent Inter. Assoc. of Road Congresses. 1 pam.
 Portland, Me.-Commr. of Public Works. 1 pam.
 Quebec, Canada-Dept. of Colonization, Mines, and Fisheries. 1 pam.
 Rhode Island-State Harbor Improvement Comm. 3 pam.
 Rosenthal, J. J. 1 pam.
 Royal Soc. of Canada. 1 bound vol.
 St. Louis, Mo.-Public Library. 1 pam.
 Salem, Mass.-Water Dept. 1 pam.
 Saskatchewan, Canada-Bureau of Public Health. 3 pam.
 Smithsonian Institution. 3 pam.
 Société de l'Industrie Minière. 1 pam.
 South Dakota-Board of R. R. Commrs. 1 bound vol.
 Springfield, Mass.-Board of Water Commrs. 1 pam.
 Switzerland-Abteilung für Landeshydrographie. 1 bound vol., 1 pam.
 Tasmania-Geol. Survey. 2 pam.
 Tennessee-Min. Dept. 1 pam.
 Texas-R. R. Comm. 1 vol.
 Tillson, George W. 1 pam.
 Tribus, Louis L. 1 pam.
 Tulane Univ. of Louisiana. 1 pam.
 Union of South Africa-Rand Water Board. 1 pam.
 U. S.-Bureau of Labor Statistics. 1 bound vol.
 U. S.-Bureau of Mines. 5 pam.
 U. S.-Bureau of the Census. 1 bound vol., 1 vol., 1 pam.
 U. S.-Coast and Geodetic Survey. 2 vol., 2 pam., 2 maps.
 U. S.-Geol. Survey. 6 vol., 17 pam.
 U. S.-Gettysburg National Park Comm. 1 map.
 U. S.-Interstate Commerce Comm. 2 pam.
 U. S.-Reclamation Service. 1 pam.
 U. S.-Secy. of the Interior. 2 bound vol., 5 pam.
 Washington-Industrial Insurance Comm. 1 pam.
 West Virginia-Board of Trade. 1 map.
 West Virginia-Dept. of Mines. 1 bound vol.
 West Virginia-Public Service Comm. 2 pam.
 Wilgus, William J. 2 vol.
 Wisconsin-Highway Comm. 1 pam.
 Wisconsin-Tax Comm. 1 pam.
 Wyoming-State Geologist. 7 pam.
 Wyoming, Univ. of. 1 pam.

BY PURCHASE

Stages of the Ohio River and Its Principal Tributaries, 1858-89.
 Compiled by the United States Weather Bureau. Washington.

Interstate Commerce Commission Reports ; Vol. 24 : Decisions of the Interstate Commerce Commission of the United States, June, 1912, to October, 1912. Reported by the Commission. Wash., 1913.

Forschungsarbeiten auf dem Gebiete des Ingenieurwesens. Herausgegeben vom Verein Deutscher Ingenieure. Hefte 158, 159, 160. Berlin, 1914.

Grandes Voûtes. Par Paul Séjourné. Tome 1-4. Bourges, 1913.

Preventive Medicine and Hygiene. Milton J. Rosenau. New York, 1914.

Elemente des Kanalbaus. Von Theodor Heyd. Darmstadt.

Poor's Manual of Industrials, Manufacturing, Mining, and Miscellaneous Companies, 1914. New York.

Metallurgy of Copper. By H. O. Hofman. New York and London, 1914.

The Steel Foundry. By John Howe Hall. New York and London, 1914.

Lessons in Practical Electricity; Principles, Experiments, and Arithmetical Problems: An Elementary Text Book. By C. Walton Swoope. Fourteenth Edition, Revised and Enlarged, with Revision of Chapter on Electric Lighting by Harry Noyes Stillman. New York, 1913.

Modern Practice in Mining: Vol. 3, Methods of Working Coal. By R. A. S. Redmayne. New York and London, 1914.

SUMMARY OF ACCESSIONS

(From July 31st to September 1st, 1914)

Donations (including 22 duplicates).....	316
By purchase.....	16
Total	332

CHANGES OF ADDRESS

STUDIOS, WILLIAM PAVLEE, 5207 Wisconsin Ave. N. W., Seattle, Wash.
 BEARD, HOMER JAMES, 102 East 12th St., New York City.
 BROWSON, THOMAS JACKSON, 1700 S. Jackson & 1st St., Dept. 1, Detroit.
 DOCK, EDWARD, North Washington, London, E. England.
 HARRIS, JOHN HARRIS, 1000 1/2 Ave. C, Room 100, Second National Bank, High, Cincinnati, Ohio.
 HUGH, EDWARD WILLIAM, 543 Asylum Ave., Hartford, Conn.
 LARKE, JOHN HOWARD, 1000 1/2 Ave. C, Room 100, Second National Bank, High, Cincinnati, Ohio.
 WORK, PAUL, 602 City Hall Annex, Boston, Mass.
 CHASE, FRANK PETER, 1000 1/2 Ave. C, Room 100, Second National Bank, High, Cincinnati, Ohio.
 DARRALL, JAMES LEE, 1000 1/2 Ave. C, Room 100, Second National Bank, High, Cincinnati, Ohio.
 GRAY, HENRY HUBERT, 1000 1/2 Ave. C, Room 100, Second National Bank, High, Cincinnati, Ohio.
 HERRICK, MILTON JACOB, 1000 1/2 Ave. C, Room 100, Second National Bank, High, Cincinnati, Ohio.

MEMBERSHIP

(From August 7th to September 3d, 1914)

ADDITIONS

MEMBERS		Date of Membership.
FRANCIS, HARRY VIVIAN. Care, P. C. Sewell, Yuille St., Brighton, Victoria, Australia.....		May 6, 1914
GRANT, JOHN ROBERT. Structural Engr., 601 Rogers Bldg., Vancouver, B. C., Canada. }	Assoc. M. }	Jan. 3, 1911
	M. }	June 24, 1914
WULFF, EBERHARD JOHN. Pres., Wulff Eng. Co.; County Engr. and Supt. of Highways, Westchester County, Tarrytown, N. Y.....		May 6, 1914

ASSOCIATE MEMBERS

DORRANCE, FRANK YOUNG. Prin. Asst. Engr., Montreal Filtration Works, 805 Du-rocher St., Montreal, Que., Canada....	Jun. }	Feb. 5, 1907
	Assoc. M. }	June 24, 1914
ELLIS, EDWARD MYRON. Asst. Engr. in Chg., Barge Canal Contract 37, Minetto, N. Y.....		May 6, 1914
HOPKINS, CHARLES ARCHER. Box 1511, Lewiston, Mont....		June 24, 1914
SAMPSON, FRANK WATKINS. 201 Texas Co. Bldg., Houston, Tex.....		June 24, 1914
SCHENK, ERNEST EUGENE. 415 East 9th St., Waterloo, Iowa.....		June 24, 1914

JUNIORS

MILLS, GUY G. Care, Am. Bridge Co., Toledo, Ohio.....	June 24, 1914
WHITNEY, JOHN THAD. Care, U. S. Engr. Office, Dam 16, Ohio River, Bens Run, W. Va.....	April 1, 1914

CHANGES OF ADDRESS

MEMBERS

ALLISON, WILLIAM FRANKLIN. 5264 Nineteenth Ave., N. E., Seattle, Wash.	
BEACH, ROBERT JAMES. 103 Park Ave., New York City.	
BONSTOW, THOMAS LACEY. Care, S. Pearson & Son, Ltd., Royal Albert Dock Extension, North Woolwich, London, E., England.	
BURKE, MILO DARWIN. Cons. Engr., Room 706, Second National Bank Bldg., Cincinnati, Ohio.	
BUSH, EDWARD WALLACE. 863 Asylum Ave., Hartford, Conn.	
CARTY, JOHN EDWARD. Designing Engr., Bridge and Ferry Div., Public Works Dept., 602 City Hall Annex, Boston, Mass.	
CHASE, FRANK LYNTON. Cons. Engr., Brunson Bldg., Columbus, Ohio.	
DARNELL, JAMES LEE. Engr. and Contr., 335 Midland Bldg., Kansas City, Mo.	
GRAY, HENRY LILBURN. Cons. Engr., 705 American Bank Bldg., Seattle, Wash.	
HENOCH, MILTON JACOB. City Bldg. Insp., City Hall, Sioux City, Iowa.	

MEMBERS (*Continued*)

- MACKSEY, HENRY VINCENT. Care, Western Dominion Ry. Co., 61 Board of Trade Bldg., Calgary, Alberta, Canada.
- MCCAUSLAND, CHARLES PATERSON. Canton, Pa.
- McKIM, JAMES ARTHUR. Galveston, Tex.
- PACKARD, RALPH GOODING. Pres., R. G. Packard Co., East 28th St., Bayonne, N. J.
- PROUT, HENRY GOSLEE. 18 Stockton Pl., Nutley, N. J.
- RICHARDSON, THOMAS FRANKLIN. 346 Montross Ave., Rutherford, N. J.
- ROSS, DOUGLAS WILLIAM. Cons. Engr., 503 Charleston Bldg., San Francisco, Cal.
- SAYERS, EDWARD LAWRENCE. Care, New River Co., Macdonald, W. Va.
- STICKNEY, GEORGE FETTER. 1503 Farmers Bank Bldg., Pittsburgh, Pa.
- WHITMER, DAVID HEIKES. Contr. Engr. (Whitmer Contr. Co.), P. O. Box 233, Pittsburg, Kans.
- WILSON, FREDERICK CHARLES. 108 Blackman Ave., Joliet, Ill.
- WOODS, ROBERT PATTERSON. Care, Board of Control, The Kansas City Rys. Co., Kansas City, Mo.

ASSOCIATE MEMBERS

- BANDY, EDWARD LEE. Ada, Ohio.
- BEE, CHARLES EVERETT. 806 East Seneca St., Ithaca, N. Y.
- BERRY, FRANCIS RIGDON. 50 Broad St., New York City.
- BRASLOW, BARNETT. Engr., Bureau of Municipal Research (Res., 668 East 220th St.), New York City.
- BROWNELL, LEONARD DEMPSTER. Res. Engr., Barge Canal Terminals, 801 Chamber of Commerce, Buffalo, N. Y.
- BURTON, WILLIAM. Const. Engr., Jause Bros., Boomer, Hughes & Crain, Calgary, Alberta, Canada.
- COPLAND, ALEXANDER CHISHOLM. Asst. Engr., C. & O. Ry., Room 1804, C. & O. Ry. General Offices, Richmond, Va.
- DOOLITTLE, FREDERICK WILLIAM. Director, Bureau of Fare Research, Am. Elec. Ry. Assoc., 29 West 39th St., New York City.
- FOGG, PERCIVAL MORRIS. Engr., U. S. Reclamation Service, Lawton, Okla.
- FORTER, SAMUEL ALEXANDER. Brigham City, Utah.
- GARDNER, WARREN. With The Public Service Comm., First Dist., 207 West 56th St., New York City.
- GEHRING, HERBERT AUGUST. Trinity College, Hartford, Conn.
- GOODRICH, CLINTON RAYMOND. Care, James Stewart & Co., Inc., 300 North Broadway, St. Louis, Mo.
- HANDEYSIDE, CHARLES AUGUSTUS. 1300 Old Colony Bldg., Chicago, Ill.
- HARPS, HARRY MACY. 100 Lewis St., Perth Amboy, N. J.
- JAMES, ALFRED RANDOLPH. Care, Speedwell Constr. Co., 119 West 40th St., New York City.
- KALLASCH, WINFRED MILLER. Vice-Pres., Illinois Hydr. Stone & Constr. Co., Room 31, Hubbard Bldg., Elgin, Ill.
- KORSMO, AMUND MARIUS. 6226 Lakewood Ave., Chicago, Ill.

ASSOCIATE MEMBERS (Continued)

- LIGHTFOOT, WILLIAM JOSEPH. U. S. Surv., Dept. of the Interior, Care, U. S. Surveyor-General, Dorris, Cal.
- LONG, CLARENCE BURTON. Res. Engr., U. S. Reclamation Service, Fletcher, via Browning, Mont.
- MACLEAN, WILLIAM EUSTACE. 911 Rogers Bldg., Vancouver, B. C., Canada.
- MCINTYRE, WILLIAM AINSWORTH. Rd. Engr., Assoc. of Am. Portland Cement Mfrs., 808 Bellevue Court Bldg., Philadelphia, Pa.
- MATSON, THOMAS HATCHER. Asst. Engr., U. S. Reclamation Service, 731 Wells Fargo Bldg., San Francisco, Cal.
- MILLER, HIRAM. 307 Fountain St., Westville, Conn.
- NEWTON, JOHN PARSONS. Hydr. Engr., Lake Erie and Ohio River Canal Board, 1503 Farmers Bank Bldg., Pittsburgh, Pa.
- PERRY, FRANCIS WILLIAM. Engr. of Constr., Dept. of Bridges, New York City (Res., 161 Fenimore St., Brooklyn, N. Y.).
- PETERSON, OTTO WALLACE. Fall River Mills, Cal.
- PHILLIPS, SILAS BENT. Asst. Engr., Ore.-Wash. R. R. & Nav. Co., 1209 Wells Fargo Bldg., Portland, Ore.
- RICE, JOHN MARIE THOMAS. Civ. Engr. with Morris Knowles, Cons. Engr., 6823 Thomas Boulevard, Pittsburgh, Pa.
- ROBERTS, HARRY ASHTON. Asst. Supt., Montana Div., Ore. Short Line R. R., Lawrence, Kans.
- SCHICK, HERMAN SCHOVE. Care, U. S. Engr.'s Office, Dam 17, Ohio River, Marietta, Ohio.
- SEXTON, RALPH ERNEST. Supt., Constr., Permanent Bldgs., Panama Canal, Corozal, Canal Zone, Panama.
- SHEDD, GEORGE GARNETT. Care, Roger Sherman, Lincoln, Mass.
- SHEFFIELD, EDWARD NEWTON. Civ. Engr. and Surv., 135 Main St., Nashua, N. H.
- SMITH, CLAIBORNE ELLIS. Baird, Cal.
- SMITH, TRAVIS LOGAN, JR. Civ. Engr. and Surv., 412 Scanlan Bldg., Houston, Tex.
- STEVENS, PERLEY EGBERT. 799 Oakdale Ave., St. Paul, Minn.
- STEWART, JOHN WELLINGTON. Asst. Engr., A. T. & S. F. Ry., Care, Chf. Engr., A. T. & S. F. Ry., Topeka, Kans.
- SWICKARD, ANDREW. 216 Fulton St., Palo Alto, Cal.
- TREVARTHEN, DWIGHT CUTLER. 421 South 6th St., Kingfisher, Okla.
- WILLIAMS, ENRIQUE RUIZ. Care, Camoa Quarry Co., Lonja del Comercio 421, Havana, Cuba.
- WILLIAMS, JACOB PAUL JONES. Chautauqua, N. Y.
- WOODWARD, GUY ERIC. Care, U. S. Reclamation Service, Camp No. 3, Pes-can, via Browning, Mont.

ASSOCIATES

- PACKARD, RALPH GOODING, JR. Vice-Pres., R. G. Packard Co., East 28th St., Bayonne, N. J.
- WRENN, JAMES FRANCIS. Vice-Pres. and Gen. Mgr., McGuire Constr. Co., Easton, Md.

- JUNIORS
- BANKS, CHARLES WILBUR. Asst. Engr., Board of Water Supply, 29 Mountain Ave., Mt. Kisco, N. Y.
- BEGGS, GEORGE ERLE. 132 Mercer St., Princeton, N. J.
- BUSHELL, ARTHUR WILLIAM. 135 Edwards St., New Haven, Conn.
- CHAPMAN, ASA B. 731 Wells Fargo Bldg., San Francisco, Cal.
- DAY, WARREN ELLIS. Care, Utah Power & Light Co., 503 Kearns Bldg., Salt Lake City, Utah.
- DRAKE, RALPH EDMUND. Asst. Engr., New York State Eng. Dept., Barge Canal Div. Engr.'s Office, 17 Battery Pl., New York City.
- GUISSINGER, JOHN ADAM. Box 415, Wynne, Ark.
- JESSUP, WALTER EDGAR. Care, U. S. Reclamation Service, Box 765, Mesa, Ariz.
- MORRISON, WILLIAM HARRISON, JR. Box 134, Toms River, N. J.
- MORROW, CLARENCE EDGAR. Instr. in Architectural Eng., Mass. Inst. Tech., 1897 Beacon St., Brookline, Mass.
- RICHARDS, ARTHUR. Kennett, Mo.
- SERRA, JULIUS HERSCHEL. 2021 East 14th St., Brooklyn, N. Y.
- WEBER, DANIEL RISHEL. Box 383, Monroe, Wash.
- WILSON, WILLIAM WEST. Care, D. W. Lum, Special Engr., So. Ry., Washington, D. C.
- WISKOCIL, CLEMENT TEHLE. Room 109, Civ. Eng. Bldg., Univ. of California, Berkeley, Cal.
- YOUNG, GEORGE LELAND. 625 Springdale Ave., East Orange, N. J.

EXPULSIONS

ASSOCIATE MEMBER	Date of Expulsion.
RIGHTMIRE, ESTEL DEAN.....	Sept. 2, 1914

DEATHS

- GAY, LEON LINCOLN. Elected Junior, December 5th, 1905; Associate Member, October 2d, 1907; died May 6th, 1914.
- GRANT, JUSTUS HERBERT. Elected Member, March 2d, 1892; died August 1st, 1914.
- MACALLISTER, DICKINSON. Elected Member, April 1st, 1896; died July 31st, 1914.
- OESTREICH, HENRY LEWIS. Elected Junior, October 4th, 1892; Associate Member, December 6th, 1899; Member, April 6th, 1909; died August 13th, 1914.
- PETERS, JOHN MARVIN. Elected Junior, May 1st, 1906; Associate Member, November 1st, 1910; died July 21st, 1914.
- WASHINGTON, WILLIAM DE HERTBURNE. Elected Associate Member, October 5th, 1892; died August 30th, 1914.

Total Membership of the Society, September 3d, 1914,

7 539.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(July 24th to August 29th, 1914)

NOTE.—This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- | | |
|--|---|
| (1) <i>Journal</i> , Assoc. Eng. Soc., Boston, Mass., 30c. | (30) <i>Annales des Travaux Publics de Belgique</i> , Brussels, Belgium, 4 fr. |
| (2) <i>Proceedings</i> , Engrs. Club of Phila., Philadelphia, Pa. | (31) <i>Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand</i> , Brussels, Belgium, 4 fr. |
| (3) <i>Journal</i> , Franklin Inst., Philadelphia, Pa., 50c. | (32) <i>Mémoires et Compte Rendu des Travaux</i> , Soc. Ing. Civ. de France, Paris, France. |
| (4) <i>Journal</i> , Western Soc. of Engrs., Chicago, Ill., 50c. | (33) <i>Le Génie Civil</i> , Paris, France, 1 fr. |
| (5) <i>Transactions</i> , Can. Soc. C. E., Montreal, Que., Canada. | (34) <i>Portefeuille Economiques des Machines</i> , Paris, France. |
| (6) <i>School of Mines Quarterly</i> , Columbia Univ., New York City, 50c. | (35) <i>Nouvelles Annales de la Construction</i> , Paris, France. |
| (7) <i>Gesundheits Ingenieur</i> , München, Germany. | (36) <i>Cornell Civil Engineer</i> , Ithaca, N. Y. |
| (8) <i>Stevens Institute Indicator</i> , Hoboken, N. J., 50c. | (37) <i>Revue de Mécanique</i> , Paris, France. |
| (9) <i>Engineering Magazine</i> , New York City, 25c. | (38) <i>Revue Générale des Chemins de Fer et des Tramways</i> , Paris, France. |
| (11) <i>Engineering</i> (London), W. H. Wiley, New York City, 25c. | (39) <i>Technisches Gemeindeblatt</i> , Berlin, Germany, 0, 70m. |
| (12) <i>The Engineer</i> (London), International News Co., New York City, 35c. | (40) <i>Zentralblatt der Bauverwaltung</i> , Berlin, Germany, 60 pfg. |
| (13) <i>Engineering News</i> , New York City, 15c. | (41) <i>Electrotechnische Zeitschrift</i> , Berlin, Germany. |
| (14) <i>Engineering Record</i> , New York City, 10c. | (42) <i>Proceedings</i> , Am. Inst. Elec. Engrs., New York City, \$1. |
| (15) <i>Railway Age Gazette</i> , New York City, 15c. | (43) <i>Annales des Ponts et Chaussées</i> , Paris, France. |
| (16) <i>Engineering and Mining Journal</i> , New York City, 15c. | (44) <i>Journal</i> , Military Service Institution, Governors Island, New York Harbor, 50c. |
| (17) <i>Electric Railway Journal</i> , New York City, 10c. | (45) <i>Colliery Engineer</i> , Scranton, Pa., 25c. |
| (18) <i>Railway Review</i> , Chicago, Ill., 15c. | (46) <i>Scientific American</i> , New York City, 15c. |
| (19) <i>Scientific American Supplement</i> , New York City, 10c. | (47) <i>Mechanical Engineer</i> , Manchester, England, 3d. |
| (20) <i>Iron Age</i> , New York City, 20c. | (48) <i>Zeitschrift, Verein Deutscher Ingenieure</i> , Berlin, Germany, 1, 60m. |
| (21) <i>Railway Engineer</i> , London, England, 1s. 2d. | (49) <i>Zeitschrift für Bauwesen</i> , Berlin, Germany. |
| (22) <i>Iron and Coal Trades Review</i> , London, England, 6d. | (50) <i>Stahl und Eisen</i> , Düsseldorf, Germany. |
| (23) <i>Railway Gazette</i> , London, England, 6d. | (51) <i>Deutsche Bauzeitung</i> , Berlin, Germany. |
| (24) <i>American Gas Light Journal</i> , New York City, 10c. | (52) <i>Rigasche Industrie-Zeitung</i> , Riga, Russia, 25 kop. |
| (25) <i>Railway Age Gazette</i> , Mechanical Edition, New York City, 20c. | (53) <i>Zeitschrift, Oesterreichischer Ingenieur und Architekten Verein</i> , Vienna, Austria, 70h. |
| (26) <i>Electrical Review</i> , London, England, 4d. | (54) <i>Transactions</i> , Am. Soc. C. E., New York City, \$12. |
| (27) <i>Electrical World</i> , New York City, 10c. | (55) <i>Transactions</i> , Am. Soc. M. E., New York City, \$10. |
| (28) <i>Journal</i> , New England Water-Works Assoc., Boston, Mass., \$1. | (56) <i>Transactions</i> , Am. Inst. Min. Engrs., New York City, \$6. |
| (29) <i>Journal</i> , Royal Society of Arts, London, England, 6d. | |

- (57) *Colliery Guardian*, London, England, 5d.
 (58) *Proceedings*, Engrs.' Soc. W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
 (59) *Proceedings*, American Water-Works Assoc., Troy, N. Y.
 (60) *Municipal Engineering*, Indianapolis, Ind., 25c.
 (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
 (62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
 (63) *Minutes of Proceedings*, Inst. C. E., London, England.
 (64) *Power*, New York City, 5c.
 (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
 (66) *Journal of Gas Lighting*, London, England, 6d.
 (67) *Cement and Engineering News*, Chicago, Ill., 25c.
 (68) *Mining Journal*, London, England, 6d.
 (69) *Der Eisenbau*, Leipzig, Germany.
 (71) *Journal*, Iron and Steel Inst., London, England.
 (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
 (72) *American Machinist*, New York City, 15c.
 (73) *Electrician*, London, England, 18c.
 (74) *Transactions*, Inst. of Min. and Metal., London, England.
 (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
 (76) *Brick*, Chicago, Ill., 10c.
 (77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
 (78) *Beton und Eisen*, Vienna, Austria, 1. 50m.
 (79) *Forscharbeiten*, Vienna, Austria.
 (80) *Tonindustrie Zeitung*, Berlin, Germany.
 (81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
 (82) *Mining and Engineering World*, Chicago, Ill., 10c.
 (83) *Gas Age*, New York City, 15c.
 (84) *Le Ciment*, Paris, France.
 (85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
 (86) *Engineering-Contracting*, Chicago, Ill., 10c.
 (87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
 (88) *Bulletin of the International Ry. Congress Assoc.*, Brussels, Belgium.
 (89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., \$5.
 (90) *Transactions*, Inst. of Naval Archts., London, England.
 (91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
 (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
 (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
 (94) *The Boiler Maker*, New York City, 10c.
 (95) *International Marine Engineering*, New York City, 20c.
 (96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
 (98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
 (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$2.
 (100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
 (101) *Metal Worker*, New York City, 10c.
 (102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
 (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
 (104) *The Surveyor and Municipal and County Engineer*, London, England, 8d.
 (105) *Metallurgical and Chemical Engineering*, New York City, 25c.
 (106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
 (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
 (108) *Southern Machinery*, Atlanta, Ga., 10c.
 (109) *Journal*, Boston Soc. C. E., Boston, Mass., 50c.
 (110) *Journal*, Am. Concrete Inst., Philadelphia, Pa., 50c.
 (111) *Journal of Electricity, Power and Gas*, San Francisco, Cal., 25c.

LIST OF ARTICLES

Bridges.

- Cost of Labor and Materials Used in Painting the St. Louis Municipal Bridge.* R. D. Spradling. (86) July 15.
 Bridge Pin-Boring Machine.* (14) July 22.
 Large Masonry Arches on Swiss Mountain Railway.* J. C. Van Langendonck. (13) July 23.
 Putting 13-In. Pins in Place of 10-In. Pins, Williamsburg Bridge.* O. E. Hovey. (13) July 23.
 The Superstructure of the New Quebec Bridge.* (12) July 24.
 High Cantilever Bridge in Mexico.* (23) July 24.
 Ultimate Strength of Carbon-Steel Models of Quebec Bridge Members.* (14) July 25; (12) July 31.
 Standard I-Beam and Pile Highway Bridges of the Iowa State Highway Commission.* (86) July 29.
 The Swiss Government Bridge Rules of 1913. (23) July 31.

*Illustrated.

Bridges—(Continued).

- Approaches to North Side Point Bridge over Allegheny River at Pittsburgh, Consisting in Part of Reinforced Concrete Arch Spans and in Part of Solid Earth-and Slag-Fill between High Retaining Walls. (14) Aug. 1; (86) Aug. 26.
- Heavy Loading Tests of Concrete Piles; Cast-in-Place Piles Driven in Filled Ground and Subjected to 36-Hour 60-Ton Loads with 3/16-Inch Average Settlement.* (14) Aug. 1.
- Hamburg Turnpike Lift Bridge.* (14) Aug. 1.
- A Concrete-Incased Steel Viaduct at Chicago.* (13) Aug. 6.
- The Ohio River Bridge at Metropolis; Record-Breaking Simple Truss Span.* (13) Aug. 6.
- Noteworthy Concrete Structures on the Lake Erie & Eastern R. R.* (13) Aug. 6.
- Load-Tests on Concrete Piles, North Side Point Bridge Approach, Pittsburgh.* (13) Aug. 6.
- Construction Plant Layout for a 1200-Ft. Concrete Arch Bridge.* E. P. Knollman. (13) Aug. 6.
- The Scherzer Bridge Over the Pamban Channel.* (12) Aug. 7.
- Notes on the Protection of the Foundations of Chepstow Bridge Over the River Wye, in Ferro-Concrete.* E. S. Sinnott. (104) Serial beginning Aug. 7.
- Quebec Bridge Girders and Wind Anchorage.* (14) Aug. 8.
- Cantilever Span of the Bloomfield Viaduct, Pittsburgh.* (13) Aug. 13.
- Reconstruction of the Queensboro Bridge.* (13) Aug. 13.
- The Highland Railway and Cannon Street Accidents.* (12) Aug. 14.
- Track Arrangement Adopted for Queensboro Bridge, New York City. (14) Aug. 15.
- Great Northern Ry. Improvements at Seattle, Wash.* E. E. Adams. (13) Aug. 20.
- A Swiss Reinforced Concrete Arch Bridge.* (96) Aug. 20.
- Replacing a Swing Bridge with a Vertical Lift Structure.* (15) Aug. 21.
- A Unique Method of Strengthening a Truss Bridge.* Wm. H. Warnecke. (15) Aug. 21.
- Skeleton Abutments for Railroad Viaducts.* (14) Aug. 22.
- Hell Gate Arch Skewbacks: Details of Sectional Cast-Steel Bearings for the 977½-Foot Span.* (14) Aug. 22.
- Bridge Cost Record Used by the Illinois Highway Commission. (86) Aug. 26.
- Chicago Bridge Work by Day Labor.* Harry J. McDargh. (13) Aug. 27.
- Burrard Inlet Bridge, Vancouver.* (96) Aug. 27.
- Linking India and Ceylon by Railway, Difficulties of Bridge Construction with Native Labor.* F. C. Coleman. (19) Aug. 29.
- Schwingungen von Brücken.* Alfred Hawranek. (69) July.
- Brücke über den Nymphenburger Kanäle im Zuge der Ludwig-Ferdinand Strasse.* Bosch. (78) July 18.

Electrical.

- The Use of Synchronous Condensers with Transmission Lines.* H. B. Dwight. (5) Vol. 27, Pt. 2.
- The Engineering Problem of Electrification. A. H. Armstrong. (5) Vol. 27, Pt. 2.
- An Analysis of the Benefits of Electric Drive in Cement Mills.* Thos. H. Arnold. (2) July.
- Power Problem in the Lehigh District.* Hermann V. Schreiber. (2) July.
- The Differential Equations of Long Distance Transmission. Geo. R. Dean. (73) Serial beginning July 17.
- The Latest Type of Rennerfelt Furnace.* (26) July 17.
- The Use of Electric Motors in Railway Shops. B. F. Kuhn. (Abstract of paper read before the Am. Master Mechanics' Assoc.) (47) July 17.
- The Thermo-Relay, a New Protective Device.* B. B. Beckett. (111) July 25.
- History of Electrical Transmission. G. O. Wilson. (111) Serial beginning July 25.
- Hydroelectric Construction in Northern Mexico.* A. C. Hobble. (27) July 25.
- An Electric Air-Hammer Drill.* (13) July 30.
- Government v. Private Ownership. T. P. Sylvan. (Abstract of paper read before the Richmond Telephone Soc.) (73) July 31.
- Recent Extensions at the Newport (Mon.) Generating Station.* (73) July 31; (26) Aug. 14.
- Standardization Rules of the American Institute of Electrical Engineers. (42) Aug.
- A Distribution System for Power Purposes.* F. D. Nims. (42) Aug.
- The Effect of Delta and Star Connections Upon Transformer Wave Forms.* Leslie F. Curtis. (42) Aug.
- Economy in the Operation of 55 000 Volt Insulators.* M. T. Crawford. (42) Aug.
- Erecting a Steel Tower Transmission Line.* Alfred Still. (83) Aug. 1.
- Municipal Street-Lighting Plant at Kalamazoo, Mich.* (27) Aug. 1.

*Illustrated.

Electrical—(Continued).

- The Storm Detector.* W. H. Lawrence. (From *General Electric Review*.) (19) Aug. 1.
- Moving Loaded Electric-Light Poles.* C. E. Drayer. (13) Aug. 6.
- The Rating of Switchgear Conductors. B. E. G. Mittell. (73) Aug. 7.
- Electric-Service System at Evansville, Ind.* (27) Aug. 8.
- Resonance Tests of Long Transmission Line. A. E. Kennelly and Harold Pender. (27) Aug. 8.
- The Development of Electric Traction. John R. Hewett. (From *General Electric Review*.) (96) Aug. 13.
- Recent Developments in Mercury Vapour Converters.* Maurice Leblanc, Jr. (Translated from *L'Electro*.) (73) Aug. 14.
- Application of Telephone Relays to Commercial Circuits. C. Robinson and R. M. Chamney. (73) Aug. 14.
- Concrete Pipe for Subaqueous Tunnels.* J. C. Lathrop. (13) Aug. 15.
- Electric Distribution Standards in San Diego.* L. M. Klauber. (111) Serial beginning Aug. 15.
- Single Unit 5 000-kw. Steam Plant at Alton, Ill.* (27) Aug. 15; (17) Aug. 15.
- Determination of Wave-Length in Radiotelegraphy.* A. S. Blatterman. (27) Aug. 15.
- Development of the Westinghouse Turbine Reduction Gear.* (19) Aug. 15.
- Difficulties in Initial Operation of a 110 000-Volt Transmission Line.* Frank G. Allen. (13) Aug. 20.
- Texas' Largest Central Station.* (27) Aug. 22.
- Hydroelectric Station on the Cuyahoga River.* (27) Aug. 22.
- Power Plant at Hillsboro, Ill.* Thomas Wilson. (64) Aug. 25.
- The Helfenstein Large Electric Furnace.* C. Van Langendonck. (20) Aug. 27.
- Design of Pole Foundations.* C. L. Christensen. (14) Aug. 29.
- A Permanent Electric Current Without Electro-Motive Force.* (From *Nieuwe Rotterdam'ssche Courant*.) (46) Aug. 29.
- High-Tension Distribution in Central Texas.* (27) Serial beginning Aug. 29.
- A New Marconi Transatlantic Service.* John L. Hogan, Jr. (27) Aug. 29.
- Elektrische Beheizung von Gebäuderäumen. H. Tschirner. (7) July 4.
- Ueber ein neues radiotelephonisches System.* Ludwig Kühn. (41) July 16.
- Bemerkungen über das Silbervoltameter. W. Jaeger und H. von Steinwehr. (41) July 16.
- Ein Beitrag zur Berechnung der Zahninduktionen in Dynamoankern.* F. Blanc. (41) July 23.
- Die Hochspannungstechnik auf der schweizerischen Landesausstellung in Bern. Karl Kuhlmann. (41) July 23.
- Betriebsregulierung von Leitungsnetzen durch Maximal-Zeitrelais. P. Bendmann. (41) July 23.
- Das Audion als Generator für Hochfrequenzströme. Lee de Forest. (41) July 23.

Marine.

- Twenty Years' Progress in Marine Construction. Alexander Gracie. (63) Vol. 194.
- Progress in the Marine Steam Engine on the North-East Coast. A. C. Ross. (Paper read before the North-East Coast Institution.) (12) July 24; (47) Aug. 14.
- Controlling Ships' Engines Directly from the Bridge.* (19) July 25.
- The Armament of the Spanish Battleship *Espana*.* (11) July 31.
- The Mumford Paraffin Motors.* (12) July 31.
- Recent Developments in Marine Propulsion. W. H. Watkinson. (Paper read before Liverpool Univ.) (12) Aug. 7.
- Oil-Carrying Steamers.* (11) Aug. 7.
- Suction between Passing Ships.* Sidney A. Reeve. (11) Serial beginning Aug. 7.
- How Yachts are Measured.* Herbert T. Wade. (46) Aug. 8.
- Ice-Breaking Railway-Train Ferry *Leonard*.* (11) Aug. 14.
- The New Coaling Dock at St. Thomas.* C. T. Mason. (19) Aug. 15.
- Les Paquebots *Imperator* et *Vaterland* de la Hamburg-Amerika Linie.* M. Hachebet. (33) Aug. 1.

Mechanical.

- The Use of Anti-Piping Thermit in Casting Steel Ingots.* E. A. Beck. (56) Vol. 45.
- Commercial Production of Sound Steel Ingots.* Emil Gathmann. (56) Vol. 45.
- Plant for Hadfield Method of Producing Sound Steel Ingots.* Robert A. Hadfield. (56) Vol. 45.
- The Production of Solid Steel Ingots.* Benjamin Talbot. (56) Vol. 45.

*Illustrated.

Mechanical—(Continued).

- The Use of Steam Compression as a Means of Recovering Energy. Pietro Oppizzi. (From *Politecnico*.) (88) July.
- An Analysis of the Benefits of Electric Drive in Cement Mills.* Thos. H. Arnold. (2) July.
- The Application of Low-Temperature Carbonization to Gas-Works. G. E. Foxwell. (66) July 14.
- Gas Firing for Boilers.* Birkholz. (Paper read before the Westphalian Dist. Assoc. of German Engrs.) (22) July 17.
- The Pullagar Gas Engine.* (26) July 17.
- Buck's Gear-Cutting Machine.* (47) July 24.
- 200-Ton Cutting-Out and Forming Press.* (11) July 24.
- Steering Air Craft at Sea.* (46) July 25.
- The Large Quantity Measurement of Artificial Gases in Distribution Systems.* J. C. Wilson. (Paper read before the Wisconsin Gas Assoc.) (24) July 27.
- The Moline Power Plant.* Thomas Wilson. (64) July 28.
- Graphite Treatment for Boiler Scale. L. W. Brooks. (13) July 30.
- The Charging of Two-Cycle Internal Combustion Engines. B. Hopkinson. (Paper read before the North-East Coast Institution of Shipbuilders and Engrs.) (12) July 31; (11) July 17; (47) July 31.
- Surface Combustion. William A. Bone. (29) Serial beginning July 31.
- Feedwater and its Treatment.* William Borrowman. (Paper read before the Scottish Federated Inst. of Min. Students.) (22) July 31.
- Waste Heat vs. Coal Under Boilers. J. C. Edwards. (45) Aug.
- Arcwall Coal Cutters.* N. D. Levin. (45) Aug.
- The Plant of the Wyandotte Portland Cement Company.* (67) Aug.
- The Handling of Coal at the Head of the Great Lakes.* G. H. Hutchinson. (55) Aug.
- Modern Coal-Boat Unloading.* J. F. Springer. (45) Aug.; (46) Aug. 15.
- Minneapolis Flour Milling.* Chas. A. Lang. (55) Aug.
- Producer Gas from Low-Grade Fuels.* R. H. Fernald. (3) Aug.
- The Manufactured Gas Industry in America.* Gilbert Colville Shadwell. (62) Aug. 3.
- Recent Improvements in Gas Manufacture. Alfred E. Forstall. (Paper read before the Soc. of Chemical Industry.) (24) Aug. 3.
- What Gas Can Do for Cinema Theatres.* H. C. Widlake. (66) Aug. 4.
- Gadsden Steam Power Plant, Gadsden, Ala.* Warren O. Rogers. (64) Aug. 4.
- Oils and Lubrication. L. D. Allen. (64) Serial beginning Aug. 4.
- Link-Belt Malleable Foundry at Indianapolis.* (20) Aug. 6.
- The Hayden Fine Spindle Automatic Screw Machine.* (72) Aug. 6.
- Some Tests on a Diesel Engine. Walter S. Burns. (Paper read before the Institution of Engrs. and Shipbuilders in Scotland.) (47) Aug. 7.
- Oils and Lubrication. L. D. Allen. (64) Serial beginning Aug. 4.
- Wm. C. Gray. (Paper read before the Institution of Engrs. and Shipbuilders in Scotland.) (47) Aug. 7.
- Knock-Off Pressures for Hydraulic Baling Press Pumps.* P. H. Parr. (12) Aug. 7.
- High-Speed Bearings. Gerald Stoney. (Paper read before the North-East Coast Institution of Engrs. and Shipbuilders.) (11) Aug. 7.
- The Diesel Engine.* (From the *Sibley Journal of Engineering*.) (19) Aug. 8.
- Plant of Dime Savings Bank Building, Detroit.* Thomas Wilson. (64) Aug. 11.
- New Drilling Data from 6-ft. Radials.* H. M. Norris. (72) Aug. 13.
- Tin Plate Manufacture in Modern Plant.* (101) Aug. 14.
- The Carey Oil Transmission System.* (12) Aug. 14.
- Thermal Phenomena in Carbonization. Herold Hollings and John W. Cobb. (Paper read before the Institution of Gas Engrs.) (83) Aug. 15; (24) Aug. 24.
- Determination of Ammonia in Gas. J. D. Edwards. (From *Circular No. 34*, U. S. Bureau of Standards.) (83) Aug. 15.
- Concrete Pipe for Subaqueous Tunnels.* J. C. Lathrop. (13) Aug. 15.
- Motor-Driven Pumps at Beardstown, Illinois.* (14) Aug. 15.
- Coal and the Chemistry of Its Carbonization. John Harger. (Paper read before the Soc. of Chemical Industry.) (24) Aug. 17.
- Proper Treatment of Crucibles in the Modern Foundry.* H. W. Gillett. (From *Bulletin 73*, U. S. Bureau of Mines.) (62) Aug. 17.
- The Manufacture of Porcelain for Electrical Purposes.* E. T. Montgomery. (76) Aug. 18.
- A Rating Chart for Centrifugal Pumps.* L. J. Bradford. (13) Aug. 20.
- Framed Concrete Engine Bed. (14) Aug. 22.
- Hand-Fired Furnaces for Water-Tube Boilers. Osborn Monnett. (64) Serial beginning Aug. 25.
- Important Steps in Manufacturing Immense Turbo-Generators.* (72) Aug. 27.
- Traveling Car-Tipple on the Sag Canal.* (13) Aug. 27.
- Stump Pulling and Grubbing Machine.* (13) Aug. 27.
- Machine à Trier, Marquer et Classer par le Poids, les Tolles Minces.* Jean Bardet. (92) July.
- Kalkbrennöfen mit Generatorgasfeuerung.* (80) July 9.

*Illustrated.

Metallurgical.

- Why Does Lag Increase with the Temperature from which Cooling Starts? Henry M. Howe. (56) Vol. 45.
- The Gay-Lussac Method of Silver Determination. Frederic P. Dewey. (56) Vol. 45.
- The Microstructure of Sintered Iron-Bearing Materials.* B. G. Klugh. (56) Vol. 45.
- New Design of Open-Hearth Steel-Furnace Using Producer Gas.* Herbert F. Miller, Jr. (56) Vol. 45.
- Notes on Cast-Iron.* Albert Sauveur. (56) Vol. 45.
- The Hardinge Conical Mill.* H. W. Hardinge. (56) Vol. 45.
- Notes on the Formation of Ferrites in Roasting Blende. G. S. Brooks. (56) Vol. 45.
- The Role of Certain Metallic Minerals in Precipitating Silver and Gold. Chase Palmer and Edson S. Bastin. (56) Vol. 45.
- Special Hazards of the Metal Industries. Stephen W. Tener. (98) July.
- Two-Blast-Furnace Plant at West Duluth.* (14) July 25.
- The National Zinc Company, Bartlesville.* E. H. Leslie. (103) July 25.
- Theory and Practice of Sherardizing.* Samuel Trood. (20) Serial beginning July 30.
- Research Work in the Laboratory and Mill. Warren F. Bleecker. (105) Aug.
- Modern Research in the Metallurgy of Iron. Allerton S. Cushman. (3) Aug.
- A New Blast Furnace to Smelt Concentrates.* Ellis W. Honeyman. (16) Aug. 1.
- Bullion Melting as Practised at Smelters. Harold French. (83) Aug. 1.
- Smelting Costs and Prices for Silver-Lead Ores. L. S. Austin. (103) Aug. 1.
- Metallurgical Plants near Salt Lake City.* (16) Aug. 8.
- Electrostatic Ore Separation.* I. C. Clark. (16) Aug. 8.
- The Raritan Copper Refining Works at Perth Amboy, New Jersey. H. B. Pulsifer. (83) Aug. 8.
- The Heat Treatment of Carbon Steel. H. P. Tiemann. (Paper read before the Technology Club of Syracuse.) (24) Aug. 10.
- Citliville Smelter of the Bartlesville Company.* E. H. Leslie. (103) Aug. 8.
- Titration Results in Cyanidation.* A. W. Allen. (103) Aug. 15.
- The Schoop Process of Metal Spraying.* (20) Aug. 20.
- Amalgamation at Liberty Bell Mill. C. Lee Peck. (16) Aug. 22.
- Ampere Efficiency in Electrolytic Refining.* Kenneth S. Guterman. (16) Aug. 22.
- Zinc Smelting at Hillsboro, Illinois.* E. H. Leslie. (103) Aug. 22.
- Development of Gold Mining in the Philippines. C. M. Eye. (103) Aug. 22.
- Nouvelles Recherches sur les Alliages de Cuivre et de Zinc.* Léon Guillet. (92) July.
- Le Traitement des Minerais Aurifères du Chatelet (Creuse).* (33) July 25.
- Der Riesendrehrohrofen und die Frage seiner Wirtschaftlichkeit. J. H. Schutt. (52) June 15.
- Die neue Hochofenanlage der Vereinigten Hüttenwerke Burbach-Eich-Düdelingen in Esch a. d. A.* Hubert Hoff. (50) Serial beginning July 16.
- Weitere Beobachtungen über die Zellenstruktur, ihre Entstehung und ihre Beseitigung durch Wärmebehandlung. Paul Oberhoffer und Hans Meyer. (50) July 23.

Military.

- The Aeroplane in War. W. S. Brancker. (19) Aug. 1.
- Correctors for the Sighting Gear of Heavy Ordnance.* (11) Aug. 7.
- The German Artillery in the War.* (46) Aug. 15.
- Night Landing Signals for War Aeroplanes.* (46) Aug. 29.
- L'Epreuve Militaire d'Endurance des Automobiles de Poids Lourds, du 1er au 30 juillet 1914.* Duroc. (33) Aug. 8.

Mining.

- The India Mica Industry.* A. Faison Dixon. (56) Vol. 45.
- A Problem in Mining, Together with Some Data on Tunnel-Driving.* F. M. Simonds and E. Z. Burns. (56) Vol. 45.
- Electric Power Installation at El Tigre, Sonora, Mexico. James W. Malcolmson. (56) Vol. 45.
- The London Mine, Mosquito Mining-District, Park County, Colo.* Charles J. Moore. (56) Vol. 45.
- Valuation of Iron-Mines. James R. Finlay. (56) Vol. 45.
- The Utilization of Exhaust-Steam for Collieries, Ironworks, etc., and the Cost of Electric Current Generated.* W. C. Mountain. (Paper read before the North of England Inst. of Min. and Mech. Engrs.) (106) Vol. 47, Pt. 3.
- Allerton Bywater Collieries. H. F. Smithson. (Paper read before the Midland Inst. of Min., Civ., and Mech. Engrs. and the Midland Counties Institution of Engrs.) (106) Vol. 47, Pt. 3.
- Ledstone Luck Colliery. J. G. Linneker. (Paper read before the Midland Inst. of Min., Civ., and Mech. Engrs. and the Midland Counties Institution of Engrs.) (106) Vol. 47, Pt. 3.

*Illustrated.

Mining—(Continued).

- Safety in Metalliferous Mines and Quarries. (Abstract of Report of the Royal Comm. on Metalliferous Mines and Quarries.) (68) July 11.
- Hydraulic Mine Filling.* Charles Enzian. (From *Bulletin* 60, U. S. Bureau of Mines.) (57) Serial beginning July 17.
- Barriers for Arresting Coal Dust Explosions.* George S. Rice and L. M. Jones. (From the *Black Diamond*.) (57) July 17.
- Colliery Consumption and Machine Economy at an Upper Silesian Colliery. Karl Schultze. (Paper read before the Midland Inst. of Min., Civ., and Mech. Engrs.) (57) Serial beginning July 24; (22) July 24.
- Switch-Gear for Mines.* E. Kilburn Scott. (Abstract of paper read before the Midland Inst. of Min., Civ., and Mech. Engrs.) (22) July 24.
- Chiksan Mines, Chosen.* Clarence L. Larson. (16) Serial beginning July 25.
- Use of the Vertical Sinking Pump.* E. Mackay Heriot. (16) July 25.
- Mine Sampling at El Tigre.* Charles M. Heron. (16) July 25.
- Archiving in Collieries.* Robert G. Clark. (Paper read before the South Wales Inst. of Engrs.) (57) July 31.
- The Britannia Colliery, Pengam.* (22) July 31.
- Mine Roof Supports.* H. I. Smith. (45) Aug.
- Maximum Coal Recovery. A. W. Hesse. (46) Aug.
- Application of Electric Motors to Gold Dredges.* Girard B. Rosenblatt. (42) Aug.
- Pembina Coal Co., Ltd.* E. I. Roberts. (45) Aug.
- Steel Construction in Mining and Ore Reduction Plants.* C. A. Tupper. (82) Aug. 1.
- Stopping Methods at the Golden Cross Mine.* Andrew W. Newberry. (16) Aug. 1.
- Dredge Construction in Portuguese East Africa. Charles Janin. (103) Aug. 1.
- Some Recent Improvements in Prussian Mining Practice.* (From *Zeitschrift für Berg, Hütten und Salinenwesen*.) (57) Aug. 7.
- Utah Copper Co.* (16) Aug. 8.
- A Hydraulic Sand-Mining Plant.* R. A. Boehringer. (13) Aug. 13.
- The Faultless Faultfinder for Mining.* Walter Scott Weeks and Edward V. Huntington. (16) Aug. 15.
- Moving Sand by Pumping.* (13) Aug. 20.
- Operations of the Marysville Dredging Co.* W. H. Wright. (16) Aug. 22.

Miscellaneous.

- Business Training for the Engineer. Alex. C. Humphreys. (8) July.
- A Conference on the Relation between National and Local Engineering Societies, and Public Affairs. (98) July.
- Review of Engineering Work in the State of Montana, 1913-1914. John H. Klepinger. (Paper read before the Montana Soc. of Engrs.) (1) July.
- Stump Burning to Reclaim "Logged-Off" Lands; Methods and Costs of Clearing Tracts for Agriculture in Pacific Northwest.* Le Roy W. Allison. (14) July 25.
- Graphic Methods of Presenting Data. Willard C. Brinton. (9) Serial beginning Aug.
- The Engineer as a Factor in Modern Progress. Alex. C. Humphreys. (3) Aug.
- Mortgages of Machinery. George A. King. (14) Aug. 8.
- Depreciation Accounting. Halford Erickson. (Paper read before the Wisconsin R. R. Comm.) (24) Aug. 10; (83) Aug. 1.
- The Designing of Reinforced Concrete Retaining Walls by Comparison with the Determined Ratios of the Various Functions of the Height and Unit Pressures.* S. M. Cotten. (86) Aug. 12.
- Further Studies of the Deodorizing Effects of Ozone. J. C. Olsen and W. H. Ulrich. (Abstract of paper read before the Am. Inst. of Chemical Engrs.) (13) Aug. 20.
- Improvements in Land Clearing Machinery.* (18) Aug. 22.
- The Nomenclature and Definition of Photometric Magnitudes and Units. A. P. Trotter. (Paper read before the Illuminating Eng. Soc.) (24) Aug. 24.
- A Novel Circular Computer.* (13) Aug. 27.

Municipal.

- The New Charter of the City of St. Louis. Wilbur B. Jones. (Paper read before the Engrs.' Club of St. Louis.) (1) July.
- City Charters in General and the Proposed City Charter of St. Louis in Particular. Carl Gayler. (Paper read before the Engrs.' Club of St. Louis.) (1) July.
- Control, Management and Maintenance of Rural Roads. J. Fred Hawkins. (Paper read before the Institution of Mun. and County Engrs.) (104) July 10.
- The Economies of Modern Methods of Road Construction. Francis Wood. (Paper read before the Institution of Mun. and County Engrs.) (104) July 10.

*Illustrated,

Municipal—(Continued).

- The Organization and Standards of the Iowa Highway Commission.* (86) July 15.
- Dust Prevention Methods on District of Columbia Suburban Roads.* L. R. Grabill. (Paper read before the Am. Road Builders' Assoc.) (86) July 15.
- Cost of Asphalt Paving Repair in St. Paul, Minn.* (86) July 15.
- Grouting and Penetrating Methods of Road Surfaces. George Green. (Paper read before the Institution of Municipal and County Engrs.) (104) July 17; (96) Aug. 6.
- Some Practical Points on Modern Road Work. W. H. Maxwell. (Paper read before the Institution of Mun. and County Engrs.) (104) July 17.
- Recent Revisions in the Standards of the New York Highway Commission.* (86) July 22.
- Bituminous Surfaces for County Roads: Permanence and Desirability.* A. B. Fletcher. (86) July 22.
- Cleaning Old Paving Brick by Compressed-Air Hammers.* Charles S. Butts. (13) July 23.
- Pavement Foundations for Heavy Traffic. Daniel B. Goodsell. (13) July 23.
- Condition of Test Road after Two Years of Service; Report on Surface Treatments of Sections Built by Office of Public Roads at Chevy Chase, Maryland. (14) July 25.
- Slag Paving Block in Washington and Baltimore. (14) July 25.
- Industrial Track Equipment for Concrete Road Building. (14) July 25.
- Construction and Maintenance of Sand Clay Roads in Georgia, Methods and Cost.* John C. Koch. (86) July 29.
- Standard Cross-Sections for Illinois Roads.* (Abstract from Report of the Illinois Highway Comm.) (86) July 29.
- Effect of High-Pressure Steam Mains under Streets.* (13) July 30.
- The Early History of Bituminous Street Pavements.* (13) July 30.
- The Use of Hydrated Lime in Concrete Mixtures for Pavements. Robert S. Edwards. (Abstract of paper read before the National Lime Mfrs. Assoc.) (67) Aug.
- Bitulithic on Macadam on Marlboro Street, Boston, Mass.* (60) Aug.
- Sub-Crust Movement in Roads Subject to Heavy Mechanical Traffic.* G. H. Jack. (104) Aug. 7.
- The Perfection of the Modern Street Pavement.* Frank W. Cherrington. (60) Aug.
- Railroad Contracting Methods Applied to the Construction of Highways; Organization Problem and Transportation of Material at a Minimum Expense Features of Central Ohio Highway Work.* (14) Aug. 1.
- Methods and Cost of Road Maintenance in San Joaquin County, California.* W. B. Hogan. (86) Aug. 5.
- A New Portable Asphalt Mixing Plant; Catskill Water Supply Roads.* (13) Aug. 6.
- Moving a 40-Ton Rock without Injury to Pavements. (14) Aug. 8.
- Connecticut's Concrete Roads.* (14) Aug. 8.
- Methods of Sampling Materials of Construction Used by the New York Highway Commission. (86) Aug. 12.
- Recent Developments in Granite-Block Paving.* (13) Aug. 13.
- Road-Oil Specifications and Tests. Clarence B. Osborne. (From *California Highway Bulletin*.) (13) Aug. 13.
- Applied Geology in Municipal Engineering. Herbert Lapworth. (Paper read before the Institution of Mun. and County Engrs.) (104) Aug. 14.
- Concrete-Lined Highway Tunnel Carrying Heavy Loads from Railroads Above it.* (14) Aug. 15.
- Organization and Standards of the Pennsylvania State Highway Department.* (86) Aug. 19.
- Slag as a Road-Surfacing Metal. (96) Aug. 20.
- The Results of City Planning in Essen, Germany.* Harold M. Lewis. (13) Aug. 20.
- Rulings on Road Building in New Jersey. (14) Aug. 22.
- Removing Core of Stockton Street Tunnel, San Francisco.* (14) Aug. 22.
- Condition of Pavements in European Cities, Conclusions in Report of George W. Tillson. (14) Aug. 22.
- Recent Paving Practice in Chicago.* A. J. Schafmayer. (14) Aug. 22.
- Details of a Reinforced Concrete Pavement in Morgan Park, Ill.* (86) Aug. 26.
- The Construction and Use of the Wooden Road Drag.* (86) Aug. 26.
- The Relation of Farm Produce Hauling to Permanent Road Improvements.* (86) Aug. 26.
- The Construction of Gravel Roads in Iowa.* T. R. Agg. (Abstract of Report to the Iowa Highway Comm.) (86) Aug. 26.
- Amended Brick-Paving Specifications; Addition of Rattler-Test Requirement and Clause Requiring Lugs, and Prohibition of any but Batch Mixer, Feature New Rules. (13) Aug. 27.

*Illustrated.

Municipal—(Continued).

- Gasoline Tractors for Southern Road Work.* G. B. Buchanan. (13) Aug. 27.
 London Asphalt Pavements Expensive; Averages for Rock Asphalt and Wood
 Block in Westminster and London Proper Show Latter to be 15 Per Cent.
 Cheaper. (13) Aug. 29.
 Le Rôle de la Chaux mélangée au Béton des Chaussées. (84) July.

Railroads.

- Piping and Segregation of Ingots of Steel and Ductility Tests for Open-Hearth
 Steel Rails. P. H. Dudley. (56) Vol. 45.
 Comparative Notes on Steel-Rail Rolling. Robert W. Hunt. (56) Vol. 45.
 Hardwood Pads for Railway Sleepers.* Krause. (From *Annalen für Gewerbe
 und Bauwesen*.) (88) July.
 Notes on the Electrification of the French Midi Railway Company.* E. Vytborek.
 (88) July.
 Single-Phase Traction and Weak Current Lines. G. Gironse. (From *La Lumière
 électrique*.) (88) July.
 Brake Trials on Long Goods Trains. A. Huberti. (88) July.
 Jubilee of the Buenos Ayres Great Southern Railway.* William Rögind. (23)
 July 10.
 New East Coast Dining Car Trains.* (23) July 10.
 Single-Phase Locomotives for the Rhaetian Railway.* (12) July 17.
 The Amur Railway.* (23) July 17.
 Locomotive for the P. L. M. Railway.* (11) July 17.
 New Tank Locomotives for the East Indian Railway.* (23) July 17.
 The Railways of the Sudan.* Percy F. Martin. (23) Serial beginning July 17.
 Costs of Surfacing Track and Features Which Influence That Cost. (86) July 22.
 Oscillating Signals for Grade Crossings.* (13) July 23.
 The Hauenstein Base Tunnel, Switzerland.* Julian Grande. (12) July 24.
 Great Indian Peninsula Railway Terminus Extension Scheme.* (23) July 24.
 New Express Locomotives, South Eastern & Chatham Railway.* (23) July 24;
 (21) Aug.
 New Low Grade Line from Tacoma, Wash., to Tenino.* (15) July 24.
 Passenger Terminal Improvements at Buffalo.* (15) July 24.
 Essentials in Successful Yard Operation. E. C. Tucker. (15) July 24.
 Hump or Flat Yards. W. B. Hendricks. (15) July 24.
 The Arnold Plan of Through Routes for Chicago Suburban Roads.* (18) July 25.
 Combined Wood and Concrete Snowsheds in Cascades. (14) July 25.
 Reconstruction of a Jersey City Railway Passenger Terminal.* (13) July 30.
 Dump Cars for Transporting Garbage by Rail.* (13) July 30.
 A Spring Guard-Rail for Frogs.* (13) July 30.
 Railway Construction in Switzerland. S. Berg. (12) Serial beginning July 31.
 The Montreal Terminal Branch of the Canadian Northern Railway.* (23) July 31.
 Electrification of Heavy Mountain Grades.* Joseph P. Ripley. (23) July 31.
 The Piercing of the Hauenstein.* (23) July 31.
 A New Shunting Locomotive, Great Northern Railway.* (23) July 31.
 The Federal Valuation of the S. P. L. A. & S. L. E. G. Tilton. (15) July 31.
 Making Provision for Emergency Grain Cars.* W. J. Tollerton. (15) July 31.
 New G. N. Line from Oroville to Wenatchee.* (15) July 31.
 Will Government Regulation Succeed? Samuel A. Dunn. (Paper read before the
 Indianapolis Transportation Club.) (15) July 31.
 The Railways of Russia. Edmond Thery. (15) July 31.
 Draft Gear Performance (for Cars). E. S. Pearce. (25) Aug.
 Engine House Efficiency. W. W. Smith. (Paper read before the General Fore-
 men's Convention.) (25) Aug.
 Electric Locomotive Data. F. D. Everett. (25) Aug.
 Pennsylvania Steel Box Car.* (25) Aug.
 Recent Locomotives, Paris-Lyons and Mediterranean Railway.* (21) Aug.
 West Coast Joint Stock Sleeping Saloons.* (21) Aug.
 Articulated Triplex Compound Locomotive, Erie Railroad.* (21) Aug.
 Railway Signalling Exhibits at the Anglo-American Exhibition.* (21) Aug.
 Central of Georgia Railway Co.* Albert M. Wolf. (87) Aug.
 Bloomington Road Track Elevation Project, Chicago, C. & C. B. Division, C. M.
 & St. P. Ry.* Albert M. Wolf. (87) Aug.
 New Engine Terminal, Lake Shore & Michigan Southern Ry., Air Line Junction,
 Ohio.* (18) Aug. 1.
 Consolidated Locomotives for the Western Maryland Ry.* (18) Aug. 1.
 Organization Methods for \$10 000 000 Track-Elevation Program (Rock Island Rail-
 road).* (14) Aug. 1.
 Problem in Railway Curves.* F. C. Snow. (14) Aug. 1.
 Recent American and European Express Locomotives.* (46) Aug. 1.
 Electrification of Steam Railways. D. D. Ewing. (Paper read before the Indiana
 Eng. Soc.) (96) Aug. 6.

*Illustrated.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Geological Survey of Canada
 Ottawa, 1911
 In the 11th Annual Report of the Geological Survey of Canada, 1911, p. 10.

Railroads—(Continued).

- Lining Long and Deeply Overlaid Tunnels.* Eugene Lauchli. (13) Aug. 6.
 New Rolling Stock on the District Railway.* (23) Aug. 7.
 New 4-6-0 Superheater Locomotives for the Ceylon Government Railway.* (23) Aug. 7.
 The Saveoil Creosoting Machine (for Railway Sleepers).* (12) Aug. 7.
 Decision in the Five Per Cent. Rate Advance Case. (15) Aug. 7; (18) Aug. 8.
 Baltimore and Ohio 2-10-2 Type Locomotive.* (15) Aug. 7.
 Santa Fe System Freight Loss and Damage Organization. H. R. Lake. (From papers read before the General Superintendents' Assoc.) (15) Aug. 7.
 Lining Tunnels on the Grand Trunk Pacific.* (14) Aug. 8.
 Continuous-Rail Crossing for Track Intersections.* (13) Aug. 13.
 World's Largest Locomotive Tested for Tractive Effort.* (13) Aug. 13.
 A Swinging Transfer Table for Shifting Locomotives.* (13) Aug. 13.
 Railroad Development in the Philippine Islands. C. H. Farnham. (15) Aug. 14.
 Building a Modern Terminal Road at Youngstown, Ohio.* (15) Aug. 14.
 Pennsylvania Railroad X25 Steel Box Car.* (15) Aug. 14.
 Time and Cost Saving with Movable Forms, Chicago, Rock Island & Pacific Reduces Time Element 75 Per Cent. and Cost 70 Per Cent. in Erecting Large Retaining Walls.* (14) Aug. 15.
 Construction Plant for Mount Royal Tunnel.* W. C. Lancaster. (14) Aug. 15.
 Concrete-Lined Highway Tunnel Carrying Heavy Loads from Railroads Above It.* (14) Aug. 15.
 Rolling Stock for Montreal Tunnel and Terminal. W. C. Lancaster. (17) Aug. 15.
 New Signals and Interlocking on the Long Island R. R. at Jamaica, L. I.* (18) Aug. 15.
 The Old Cleveland Trainshed Roof.* (13) Aug. 20.
 New Locomotive Terminal of the Central R. R. of New Jersey.* (13) Aug. 20.
 Recent Railway Construction in Chile.* Charles P. King. (13) Aug. 20.
 Fuel Economy on the Chicago, Burlington & Quincy. A. N. Willis. (15) Aug. 21.
 Making a Double Track Fill Nearly 185 ft. High.* (15) Aug. 21.
 Raising and Shifting a Six-Track Main Line.* W. F. Rench. (15) Aug. 21.
 Recent Tendencies Regarding the Canting of Rails.* (15) Aug. 21.
 Possible Railway Routes through the Rockies. (14) Aug. 22.
 Signaling and Interlocking of the Philadelphia Terminal, P. & R. Ry.* (18) Aug. 22.
 An Interesting Method for Railway Rechainning.* (13) Aug. 27.
 Calculating Earthwork Cross-sections.* (13) Aug. 27.
 Rock Island Interlocking Plant at Joliet.* (15) Aug. 28.
 Chicago, Burlington & Quincy 2-10-2 Freight Locomotive.* (15) Aug. 28.
 New Shop Building Construction on Sunset Lines.* (15) Aug. 28.
 Placing 300 000 Cubic Yards of Concrete, Special Plants and Extensive Use of Bulk Cement on Track Elevation of Chicago, Milwaukee & St. Paul Railway at Chicago.* (14) Aug. 29.
 Les Chemins de Fer Agricoles de l'Egypte.* Edouard Harran. (38) May.
 Note sur l'Usinage des Tiroirs Cylindriques de Distribution.* L. Fort. (38) July.
 Nouvelle Locomotive à Tender Moteur des Chemins de Fer de l'Erié (E.-U.).* (33) July 25.
 Projet de Voies Ferrées Monorails Suspendues Portant des Trains Electriques à Très Grande Vitesse.* A. Le Vergnier. (33) July 25.
 Station Frigorifique Expérimentale, sur Wagon, de l'Association française du Froid.* Emile Gouault. (33) Aug. 1.
 Bauanlagen für die Herstellung der elektrischen Zugförderung auf den Eisenbahnlinien Magdeburg-Bitterfeld-Leipzig-Halle.* Mentzel. (49) Serial beginning Pt. 7.
 Neuartiger Verschiebebahnhof. K. Ruzsics. (102) July 15.
 Kran für 30 t Last zum Heben von Tendern.* Bonnemann. (102) July 15.
 Ueber die Stabilität von Tunnelmauerwerk; unter Berücksichtigung der Erfahrungen beim Bau des Hauenstein-Basistunnels.* E. Wiesmann. (107) July 15.
 Der Schutz von Eisen-, Beton- und Verbundbauwerken über Eisenbahnbetriebsgleisen.* K. W. Schaechterle. (78) Serial beginning July 18.
 Ueber die stereoskopische Messkunst und einen erstmaligen Versuch ihrer Anwendung bei Eisenbahnvorarbeiten in China.* Georg A. G. Müller. (40) Serial beginning July 22.
 Vierachsiger Dynamometerwagen der Schweizerischen Bundesbahnen.* H. A. Gaudy. (107) Serial beginning July 25.
 Bergschläge im Simplontunnel.* F. Rothpletz. (107) Aug. 1.
 Amerikan Dampflokomotiven grosser Leistung.* H. A. Gaudy. (107) Aug. 15.

Railroads, Street.

- Rail Feeders for Tramways. Henry M. Sayers. (73) July 17.
 The Illumination of Tramcars. L. C. Porter and V. L. Staley. (Abstract of paper read before the Illuminating Soc.) (73) July 17.

*Illustrated.

Railroads, Street—(Continued).

- Tramway Experiences in Brazil. H. M. Sayers. (Paper read before the Newcastle-on-Tyne Congress of the Tramways and Light Railways Assoc.) (73) July 24.
- Town Planning in Relation to Tramways. J. A. Brodie. (Paper read before the Newcastle-on-Tyne Congress of the Tramways and Light Railways Assoc.) (73) July 24; (104) Aug. 7.
- Whitehall Street Tunnel, New York City; Twin Concrete-Lined Cast-Iron Tubes 6 500 Feet Long, with 300 Feet of Double-Track Concrete Arch at Manhattan End.* (14) July 25.
- Open Cars Changed to Closed Center Entrance.* (17) July 25.
- Tramway Rail Joints. Henry M. Sayers. (26) July 31.
- Municipal Street Railway of Edmonton, Alberta, Can. (60) Aug.
- New Rapid Transit Cars for London.* (17) Aug. 1.
- Electric Railway at Constantinople.* (17) Aug. 1.
- Rebuilding Summer Cars to Center Entrance Type.* G. M. Cameron. (17) Aug. 1.
- Specifications Relating to Compressed Air in Tunnel Work. Frederick C. Noble. (From the *Compressed Air Magazine*.) (96) Aug. 6.
- New Repair Shops at Louisville.* (17) Aug. 8.
- Some Track Construction Standards for 1914.* (From *Electric Traction*.) (96) Aug. 13.
- The Kansas City Street-Railway Franchise. (13) Aug. 13.
- Illinois Traction System Special Service.* (17) Aug. 15.
- Electric Safety Brakes.* (17) Aug. 15.
- Manhattan Bridge Three-Cent Line.* (17) Aug. 22.
- Old Slip Tunnel, New York City; Features of Section of New Subway System under East River, Connecting William Street, Manhattan, with Clark Street, Brooklyn.* (14) Aug. 22.
- Subway Construction at Buenos Aires.* (14) Aug. 29.
- Amerikanischer Strassenbahnbau. Günther. (39) Serial beginning July 5.

Sanitation.

- Brief Review of Sewage Disposal Works in Some European Cities and Comparison with the Pennypack Creek Works at Philadelphia.* George E. Datesman. M. Am. Soc. C. E. (59) June.
- Data and Discussion on the Design and Maintenance of Inverted Siphons in Sewers.* Frank H. Carter, Assoc. M. Am. Soc. C. E. (86) July 15.
- A \$190 000 Drainage Project in Kentucky.* (86) July 22.
- Applied Geology in Municipal Engineering. Herbert Lapworth. (Paper read before the Institution of Mun. and County Engrs.) (96) July 23; (86) Aug. 19.
- Notes on the Refuse Destructor Works and Electricity Undertaking of the Borough of Hackney. Leonard L. Robinson. (Paper read before the Institution of Mun. and County Engrs.) (104) July 24.
- Using Plow to Open Pavements (Sewer Construction).* C. A. Bryan. (14) July 25.
- Sewer Explosions and their Prevention. Leonard Metcalf and Harrison P. Eddy. (13) July 30.
- Dump Cars for Transporting Garbage by Rail.* (13) July 30.
- Tilbury and Some Particulars of a New Sewerage Scheme in the Adjoining Rural District.* S. A. Hill-Willis. (104) July 31.
- Worcester Sewage Disposal Works.* T. Caink. (Paper read before the Institution of Mun. and County Engrs.) (104) July 31.
- Automobile Street Cleaning Machines.* (60) Aug.
- Garbage Incinerators and Destructors.* Sterling H. Bunnell. (60) Aug.
- Imhoff-Tank Operation at Chambersburg.* C. F. and P. E. Mebus. (14) Aug. 1.
- The Auburn Water Case, Sanitary Lawsuit Involving the Carrying of Pollution by Wind and Water Movements. (14) Aug. 1.
- A Discussion of Relative Values in Sanitation. George C. Whipple. (Paper read before the Connecticut Soc. of Civ. Engrs.) (86) Aug. 5.
- Shoring Difficulties in St. Louis Sewer Construction. Charles C. Phelps. (13) Aug. 6.
- Washington Street-Cleaning, Field Methods.* J. W. Paxton. (13) Aug. 6.
- Heating and Ventilation in a Theater.* (101) Aug. 7.
- Outfall Sewer Construction, with Special Reference to Belfast. James Munce. (Paper read before the Royal Sanitary Inst.) (104) Serial beginning Aug. 7.
- Sewage Disinfection in Actual Practice, Observations Based on the Operation of Twenty Plants in the State of New Jersey Using Calcium Hypochlorite as a Disinfectant. William J. Orchard. (14) Aug. 8.
- Sanitation Work at Cuban Iron Mines.* Charles F. Rand. (103) Aug. 8.
- Second Explosion in Trunk Sewer, Pittsburgh.* N. S. Sprague. (14) Aug. 8.
- Explosions in Sewers; Tests as to the Explosive Qualities of Different Mixtures of Air and Gasoline Vapors Made at Yale University. (14) Aug. 8.
- Electricity Versus Steam in Drainage Pumping.* (27) Aug. 8.
- Heating the Largest Pier in the World.* Frank H. Jones. (64) Aug. 11.

*Illustrated.

Sanitation—(Continued).

- Method and Cost of Constructing an Inverted Sewer Siphon of 12-in. Cast Iron Pipe Encased in Concrete Beneath Small Stream at Carlisle, Pa.* C. A. Bryan. (86) Aug. 12; (13) Aug. 13.
- Method and Cost of Making a Relocation Survey of Underground Pipe Lines, Cincinnati, Ohio.* O. E. Carr. (86) Aug. 12.
- New Sewage Disposal Works at Bath.* (12) Aug. 14.
- A Large Open-Air Swimming and Wading Pool.* (14) Aug. 20.
- Surge Tank Problems. Franz Prasil. (96) Serial beginning Aug. 20.
- Unsolved Problems of Forced Ventilation. C. E. A. Winslow. (Paper read before the Am. Inst. of Chemical Engrs.) (101) Aug. 21.
- Public Comfort Stations in New York City.* (101) Aug. 21.
- Economic Aspects of Intermittent Sand Filters. (14) Aug. 22.
- Method and Cost of Making House Connections to the New Orleans Sewerage System. Rudolph Hering, George W. Fuller and Harrison P. Eddy. (Report to the Sewerage Board of New Orleans.) (86) Aug. 26.
- The Probable Future of Various Sewage Treatment Methods. George W. Fuller. (Report to the Metropolitan Sewerage Comm.) (86) Aug. 26.
- Construction Camp for Town of Torrance, Calif.* Ralph Bennett. (13) Aug. 27.
- The Construction of a Small Sewerage System for Garfield, N. J.* Russell S. Wise. (13) Aug. 27.
- Design of Interceptors for a Large Sewerage System.* (96) Aug. 27.
- Physiological Problems of Ventilation. Frederic S. Lee. (Paper read before the Am. Inst. of Chemical Engrs.) (101) Aug. 28.
- Procédés de Fondation des Egouts.* (84) July.
- Beitrag zur Beurteilung des Reinigungseffekts von biologischen Hauskloaranlagen. Georg Neumeyer. (7) July 4.
- Elektrische Beheizung von Gebäuderäumen. H. Tschirner. (7) July 4.
- Kanalisation von Amsterdam.* (From *De Ingenieur*.) (7) Serial beginning July 4.
- Zur Berechnung der Regenwasser-Abflussmengen für die Kanalisationsanlagen der Stadt Magdeburg.* Ewald Fischer. (39) July 5.
- Das Dimensionieren städtischer Kanäle.* Alfred Judt. (7) July 11.
- Das neue Stadtbad in Hamm in Westfalen.* Kraft. (51) July 18.
- Untersuchung eines Schlottergebläses.* Karl Brabbée und M. Kloss. (7) July 18.
- Ausnutzung der freien Räume in Sietzen während des Abflusses kritischer Regen zur Erzielung kleinerer Kanalquerschnitte.* Friedrich Schrank. (7) July 18.

Structural.

- Some Disregarded Stresses at Joints and Ends of Steel in Reinforced Concrete Construction.* H. A. Icke. (5) Vol. 27, Pt. 2.
- Elevator Construction.* James Spelman. (5) Vol. 27, Pt. 2.
- Principles and Details Involved in the Moving of Large Structures.* George W. Nichols. (58) Apr.
- On the Question of Workmen's Dwellings. A. F. Banks. (88) July.
- Transverse Strength of Cut Screws in Wooden Joints.* (96) July 23.
- Building a Granite Shaft 300 Ft. High; The Perry Memorial.* (13) July 23.
- Cedar Rapids Hydroelectric Development; Construction by Unit Method of Reinforced Concrete of Power House Superstructure and Transformer House for Low-Head Power Plant.* (14) July 25.
- How to Classify Rocks Quickly in the Field. Edwin C. Eckel. (14) July 25.
- Mortar-Making Qualities of Sand. (96) July 30.
- Sand Specifications. (96) July 30.
- Soft-Ground Foundations. Panama-Pacific International Exposition; Penetration and Load Tests of Piles.* L. F. Leurey. (13) July 30.
- Framework of the Equitable Building.* (13) July 30.
- Framework and Windbracing of Woolworth Building.* (13) July 30.
- The Effective Width of Reinforced-Concrete Slabs Supporting Concentrated Loads.* C. R. Young. (13) July 30.
- Gypsum Slabs for Roof Construction.* (13) July 30.
- Resistance of Timber Joints, Compression Tests of Splices made with Wood and Iron Keys for the Panama-Pacific Exposition Buildings at San Francisco.* Arthur C. Alvarez. (14) Aug. 1.
- Inclined Conveyor Belts Handling Wet Concrete. (14) Aug. 1.
- Preventing Village Fires; Building Ordinances for Small Towns Recommended by the National Board of Underwriters. (14) Aug. 1.
- Underpinning New Buildings on Swampy Soil.* (14) Aug. 1.
- Unusual Repairs to a Mill.* F. A. Camp. (14) Aug. 1.
- Ideal Brick Home No. 101. Complete Building Specifications. (76) Aug. 4, Pt. 2.
- A Comprehensive Chart for Designing Reinforced Concrete Beams.* Ralph R. Leffler. (86) Aug. 5.
- Modern Concrete Work without Forms. James E. Payne, Assoc. M. Am. Soc. C. E. (Abstract of paper read before the Am. Concrete Inst.) (96) Aug. 6.

*Illustrated.

CONTENTS—Continued.

- Method and Cost of Constructing an Irrigated Canal System of 15-in. and 18-in. Pipes. (See 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

*Illustrated.

Structural—(Continued).

- Quick Work in Foundation Excavation Under Difficulties. (14) Aug. 8.
 Power Scraper for Basement Excavation.* (14) Aug. 8.
 Compression Machine for Testing Structural Materials; Apparatus has Capacity of 125 Tons and Combines Low Cost with Small Weight and Floor Area and Low Operating Expense.* (14) Aug. 8.
 Economical Design of the Flat-Slab System; Derivation of Formulæ for Determining Proper Length of Span, Thickness of Slab and Weight of Steel Reinforcement.* Frank H. Carter, Assoc. M. Am. Soc. C. E. (14) Aug. 8.
 Moving Large Steel Grain Tanks.* (13) Aug. 13.
 Steel Framework of Adams Express Building.* (14) Aug. 15.
 Design of Adams Express Building.* H. R. Burroughs. (14) Aug. 15.
 Proposed System of Reinforcement for the Roof Timbers of Westminster Hall, England. F. Baines. (86) Aug. 19.
 An Automatic Petroleum-Tank Fire Extinguisher.* (13) Aug. 20.
 Building a Six-Story Shop Around a Heating System.* Fred H. Colvin. (72) Aug. 20.
 Salem Conflagration. (14) Aug. 22.
 Moving Four-Story Building 2500 Feet through City Streets.* (14) Aug. 22.
 Flagpole Mounting that Lowers Poles for Repairs.* (14) Aug. 22.
 Formulæ for Wind Stresses.* David Gutman. (14) Aug. 22.
 Cost of a Damp-Proof Timber Floor. J. Albert Holmes. (13) Aug. 27.
 Australian Ironbark Pins in Pin-Keyed Joint.* H. D. Dewell. (13) Aug. 27.
 The Error in Design of Columns for Bending. J. P. J. Williams. (13) Aug. 27.
 Righting a Tilted Grain Elevator.* (13) Aug. 27.
 Settlement of a Pile Foundation.* (13) Aug. 27.
 Forms for Concrete-Incased I-Beam Floor.* M. J. Lorente. (13) Aug. 27.
 Atomizing Paint on Rough Timber.* (14) Aug. 29.
 Factors Affecting Structural Timber.* H. S. Betts. (14) Aug. 29.
 Frost-Proof Inclined Skylight.* (14) Aug. 29.
 Le Béton Coulé. (84) July.
 Augmentation graduelle de Résistances des Bétons par diverses Températures. (84) July.
 Die Anwendung des Eisenbetons beim Neubau des Aquariums im Zoologischen Garten zu Berlin.* Konrad Schwartz. (78) May 7.
 Die Eisenbetonarbeiten am Royal Hotel und Winter-Palast in Gstaad (Berner Oberland).* S. Zipkes. (78) Serial beginning May 7.
 Kohlensilo für die Gelsenkirchener Bergwerks-A.-G. Hütte Vulkan Duisburg-Hochfeld.* A. Dschinger. (78) May 7.
 Halle der Leipziger Jahresausstellung (L. J.-A.) auf der Leipziger Baufach-Ausstellung 1913.* Franz Czech. (69) July.
 Der Weillblechstoß.* H. Nitzsche. (69) July.
 Ueber Balken auf elastischer Unterlage.* Keiichi Hayashi. (69) July.
 Zur Bekämpfung des Hausschwamms.* Moormann. (7) July 11.
 Die Festigkeit von Schweissseisen gegenüber Stossbeanspruchung.* E. Preuss. (50) July 16.
 Druckgilederkonstruktionen.* G. Neumann. (78) July 18.
 Kreis- und Ringplatten unter allseitig symmetrischer Belastung.* Lewe. (78) Serial beginning July 18.
 Die Grundlagen einer rationalen Berechnung der kreuzweise bewehrten Eisenbetonplatten.* M. T. Huber. (53) July 24.

Topographical.

- Modern Methods of Stadia Surveying. J. A. Macdonald. (96) July 30.
 An Interesting Method for Railway Rechainning.* (13) Aug. 27.
 Ueber die stereoskopische Messkunst und einen erstmaligen Versuch ihrer Anwendung bei Eisenbahnvorarbeiten in China.* Georg A. G. Müller. (40) Serial beginning July 22.

Water Supply.

- The Toronto Water Filtration Plant.* Francis F. Longley. (5) Vol. 27, Pt. 2.
 The Yield of Various Catchment-Areas in Scotland.* William Carstairs Reid. (63) Vol. 194.
 Assuan Dam: Iron and Steel Works Connected with its Heightening. George Stephens Perry. (63) Vol. 194.
 Bristol Waterworks: Rainfall-Statistics and Notes on Wet and Dry Cycles. John Ambrose McPherson. (63) Vol. 194.
 Assuan Dam: Protection of Down-Stream Rock Surface, and Thickening and Heightening.* Murdock Macdonald. (63) Vol. 194.
 Charges for Public Water Service to Private Fire Protection Systems. W. E. Miller. (59) 1913.
 Private Fire Protection Service Charges. Leonard Metcalf. (59) 1913.

*Illustrated.

Water Supply—(Continued).

- How a Public Water Supply was Polluted by a Private Fire Service and the Consequences.* R. J. Thomas. (59) 1913.
- Turbine Pumps for the Minneapolis City Water Works.* Edward P. Burch. (59) 1913.
- The Reforestation and General Care of Watersheds. Ermon M. Peck. (59) 1913.
- Work Done for the Prevention of Water Waste in the City of New York and Results Accomplished Thereby.* I. M. de Varona. (59) 1913.
- Basic Principles of Ground-Water Collection.* Chas. B. Burdick. (59) 1913.
- The Use of Liquid Chlorine for Sterilizing Water.* John A. Kienle. (59) 1913.
- Water Movement Compared with Air Movement and Its Relation to Lake Contamination.* J. Walter Ackerman. (59) 1913.
- Support and Aid to Health Officers. H. F. Dunham. (59) 1913.
- The Bacteria Count on Gelatin and Agar Media and Its Value in Controlling the Operations of Water Purification Plants. James M. Caird. (59) 1913.
- Some Notes on the Use of Alum in Connection with Slow Sand Filtration at Washington, D. C.* William Firth Wells. (59) 1913.
- Power for Pumping Derived from Refuse.* E. H. Foster. (59) 1913.
- On the Valuation of Water Works Special Franchises. Henry de Forest Baldwin. (59) 1913.
- Rates and Rate Making Under the Wisconsin Public Utility Law. Halford Erickson. (59) 1913.
- Hydraulic Engineering Education. Daniel W. Mead. (59) 1913.
- Undergraduate Training for Hydraulic Engineers. O. L. Waller. (59) 1913.
- What the Young Engineer Should Know on Entering Hydraulic Engineering Practice.* John C. Trautwine, Jr. (59) 1913.
- General Knowledge, Technical Training and Manual Skill. L. J. Le Conte. (59) 1913.
- Modern Filter Practice. Nicholas S. Hill, Jr. (59) 1913.
- Pure and Wholesome Water. George A. Johnson. (59) 1913.
- Micro-organism Troubles in the Operation of Mechanical Filters.* Frederick H. Stover. (59) 1913.
- The Water Purification Plant at Fargo, North Dakota.* Frank La F. Anders. (59) 1913.
- The Close Relation Existing Between the Physiological Records and the Character of the Portable Water Supply. L. J. Le Conte. (59) 1913.
- Method of Cleaning a Reservoir.* Alvin Bugbee. (59) 1913.
- Masonry Dams.* Edward Wegmann. (59) 1913.
- Filters for the Toronto Water Supply.* Francis F. Longley. (59) 1913.
- Mobile Water Supply. Edgar B. Kay. (59) 1913.
- The Minneapolis Filter Plant with a Brief History of the Events Which Led Up to Its Construction.* W. N. Jones. (59) 1913.
- Utility and Attractiveness in Economic Reservoir Design.* Alexander Potter. (59) 1913.
- A History of the Original Public Water Supply of the City of Memphis, Tennessee. William L. Cameron. (59) 1913.
- Measurement of the Velocity of Flowing Water. Lewis F. Moody. (58) May.
- A Wanderer's Notes on Foreign Water Supplies.* Louis L. Tribus, M. Am. Soc. C. E. (59) June.
- Report of Committee on Tabulation of Water Rates and Other Information of Interest to Water Companies. F. C. Jordan, C. C. Cray and W. G. Ulrich. (59) June.
- Gravity Water Supply at the City of Manila, Philippine Islands. H. E. Keeler. (59) June.
- The Use of Concrete in Water Works Construction. Edgar B. Kay. (59) June.
- Hydro-Electric Development on the Tallulah River, Georgia.* John Birkinbine. (2) July.
- Reporting on Public Service Properties. E. P. Roberts. (2) July.
- Characters of Mechanically-Filtered Water. Sheridan Delépine. (Paper read before the Institution of Water Engrs.) (66) July 14.
- Experimental Data on the Removal of Carbonic Acid from Well Water Supply at Lowell, Mass. F. A. Barbour. (From Report to the City.) (86) Serial beginning July 15.
- Construction of Water Works Tunnels in the Metropolitan Water District of Massachusetts.* William E. Foss. (86) Serial beginning July 22.
- Results of an Efficiency Investigation of the Aurora, Indiana, Water Purification Works. (86) July 22.
- Water Purification Plant, Belfast, Maine.* Robert Spurr Weston. (13) July 23.
- Experiments on the Decarbonization of Water to Prevent Lead Poisoning at Lowell, Mass. (13) July 23.
- Sooke Lake Water Supply for Victoria, B. C.* (96) July 23.
- Water Supply and Sewerage Systems for Small Communities. W. H. Dittoe. (96) July 23.

*Illustrated.

Water Supply—(Continued).

- Applied Geology in Municipal Engineering. Herbert Lapworth. (Paper read before the Institution of Mun. and County Engrs.) (96) July 23; (86) Aug. 19.
- Hydro-Electric Plant at Panama.* (96) July 23.
- A 100-Foot Steel Standpipe.* Edwin H. Warner. (14) July 25.
- Tunnel Intake for Milwaukee Waterworks; a \$2 500 000 Project Involving Twelve-Foot Tube, Built by Compressed-Air Methods, and a 120 000 000-Gallon Pumping Station. J. A. Mesiroff. (14) July 25.
- Water Consumption during the Fire at Salem.* Francis F. Longley. (14) July 25.
- Large Humphrey Pumps for the Drainage of Lake Mareotis at Mex, near Alexandria, Egypt.* (86) July 29.
- Design Features of the Rapid Sand Filtration Plant of the Kensington Water Co. at New Kensington, Pennsylvania.* (86) July 29.
- Suggestions as to the Maintenance of Driven Wells, at Lowell, Mass. (13) July 30.
- Large Surge Tank for Salmon River Power Project. (87) Aug.; (18) July 25.
- The Elephant Butte Dam.* (46) Aug. 1.
- Irrigation Manager and His Legal Problems.* F. H. Newell. (111) Aug. 1.
- Hydroelectric Developments on Public Lands in Relation to Irrigation. E. C. Finney. (111) Aug. 1.
- The Auburn Water Case, Sanitary Lawsuit Involving the Carrying of Pollution by Wind and Water Movements. (14) Aug. 1.
- Results of Water-Clarification Plant at St. Louis. (14) Aug. 1.
- Method of Sealing a Battery of Irrigation Wells. J. W. Swaren. (86) Aug. 5.
- Regulations Governing Preparations of Reports on Water Supply Systems and Extensions in Saskatchewan.* (86) Aug. 5.
- Design Features and Cost of Operating Water Filters of Pressure Type at New Canaan, Conn.* (86) Aug. 5.
- Kananaskis Falls Hydro-Electric Development.* (96) Aug. 6.
- The Concrete Mixing Plant for Elephant Butte Dam.* L. J. Charles. (13) Aug. 6.
- Analyses of Tubercles from the Interior of a Cast-Iron Water Main. (13) Aug. 6.
- Partial Failure of Standley Lake Dam, near Denver, Colo. (13) Aug. 6.
- Antwerp Waterworks Extension.* (12) Aug. 7.
- Break in Baffle Wall from Unequal Mud Pressure, Accident in St. Louis.* (14) Aug. 8.
- Concreting the Arrowrock Dam.* Charles H. Paul. (14) Aug. 8.
- Handling Meters in Milwaukee; Testing and Repairing on the Premises. (14) Aug. 8.
- Small Rapid Filter Plant at Port Clinton, Ohio; Three 500 000-Gallon Units with Non-Baffled Sedimentation Basins and Proportional Coagulant Feeder.* (14) Aug. 8.
- Method and Cost of Installing Water Service Connections at New Orleans. Rudolph Hering, George W. Fuller and Harrison P. Eddy. (From Report to the Sewerage and Water Board of New Orleans.) (86) Aug. 12.
- Narrows Siphon of the Catskill Aqueduct.* (20) Aug. 13.
- Notes on Maintenance of Wachusett Reservoir.* J. A. Cushman. (13) Aug. 13.
- The New Loch Raven Dam at Baltimore, Md.* Ezra B. Whitman. (13) Aug. 13.
- The Southern Alberta Land Co.'s Irrigation Project.* W. St. J. Miller. (13) Aug. 13.
- Storage on the Upper St. Maurice River.* (96) Aug. 13.
- The 150 000-Volt Big Creek Scheme, Los Angeles, Cal.* (73) Serial beginning Aug. 14.
- Gravity Dam at Humpback Reservoir.* (14) Aug. 15.
- Curtailment of Water Waste and Selection of Meters at Milwaukee Water Works. H. P. Bohman and Otto F. Poetsch. (From Report to the City.) (86) Aug. 19.
- Construction of Timber Logging Flumes.* (From *Bulletin*, U. S. Forest Service.) (86) Aug. 19.
- Proposed Supply for the Charlton Union Water District.* (86) Aug. 19.
- The 200 000-h.p. Development of the Mt. Shasta Power Corporation on the Pitt River, California.* (13) Aug. 20.
- Characteristics of Safe Drinking Water. Allan J. McLaughlin. (Paper read before the Inter. Joint Comm.) (96) Aug. 20.
- Changes and Enlargements of the Water-Purification Plant, Youngstown, Ohio.* (13) Aug. 20.
- Hot Pipe Dipped in Cold Tar; to Effect Economics San Francisco Method Reverses Usual Order of Immersion in Heated Bath by Warming Pipe Over Wood Fire.* (14) Aug. 22.
- The Water Supply of San Francisco.* M. M. O'Shaughnessy. (111) Aug. 22.
- Water Works and Filters for Vicksburg, Miss.* (86) Aug. 26.
- The Design and Construction of the Bassano.* H. B. Muckleston. (13) Serial beginning Aug. 27.
- Shifting Derrick Travelers, Kensico Dam.* Wilson Fitch Smith. (13) Aug. 27.
- An Air-Lift Pump with "Booster" for Horizontal Delivery.* (13) Aug. 27.
- Swimming Pool of Modern Construction.* (101) Aug. 28.
- Seros Hydroelectric Development in Spain.* (14) Serial beginning Aug. 29.

*Illustrated.

Water Supply—(Continued).

- Accident au Grand Siphon Métallique de l'Aqueduc de Los Angeles, California. (33) Aug. 8.
 Die zukünftige Wasserversorgung der Stadt Gleiwitz. Hache. (7) July 11.
 Versuche über Druckschwankungen in eisernen Rohrleitungen.* A. Strickler. (107) Aug. 15.

Waterways.

- The Ground Waters. James F. Kemp. (56) Vol. 45.
 Measurement of the Flow of the River Derwent, Derbyshire.* Edward Sandeman. (63) Vol. 194.
 Coastal Sand-Travel, near Madras Harbour.* Francis Joseph Edward Spring. (63) Vol. 194.
 Light House Lenses.* George A. Macbeth. (58) Apr.
 Opening of New Lock at Alexandra (Newport and South Wales) Docks.* (22) July 17; (23) July 17; (12) July 17.
 The Port of Calcutta.* (11) July 17.
 Dock Wall Gangway and Gangway Bridge, Barge Canal Terminals, Troy, N. Y.* (86) July 22.
 The Houston Ship Channel.* Charles Crotty. (13) July 23.
 Superiority of the V-Shaped Flume in Logging. (13) July 23.
 Remarkable Pile-driving (Halifax, Nova Scotia). (29) July 24.
 Pittsburgh Flood Commission Answers Sir William Willcocks. (14) July 25.
 Bearing of Piles in Silt; Long Continued Loading Tests of Groups of 90-foot Lagged Wooden Piles for Municipal Piers in New York City.* (14) July 25.
 Part of Wharf at Port Arthur, Ontario, Collapses.* C. E. Henderson. (14) July 25.
 Municipal Harbor Construction in Minneapolis.* (13) July 30.
 Deep Water Terminals at Halifax.* T. W. J. Lynch. (96) July 30.
 The Undercliff Drive Extension at Bournemouth.* (12) July 31.
 Carnarvon Sea Wall.* H. C. Ritchie. (104) July 31.
 The Building of Concrete Culverts.* Edward J. Whalen. (67) Aug.
 Largest Steamship Pier on Manhattan Island; Rock Foundations and Long Mud-Bearing Piles Combined in West Forty-sixth Street Structure, Adjacent 1 000 x 360-foot Slips, 44 Feet Deep.* (14) Aug. 1.
 Indiana Levee District; Thirty-one Miles of Levee and Two Pumping Stations with 250 000 Gallons per Minute Capacity.* (14) Aug. 1.
 The Savannah River Levee, Augusta, Ga.* Nisbet Wingfield. (13) Aug. 6.
 Water-Level of the Great Salt Lake.* J. Cecil Alter. (13) Aug. 6.
 New Lighthouse at Cape Point.* H. C. Cooper. (12) Aug. 7.
 Operations of Kansas City Municipal Wharf.* Clark R. Mandigo, Assoc. M. Am. Soc. C. E. (14) Aug. 8.
 Recent Levee Work to Protect Imperial Valley.* (14) Aug. 8.
 Report of Consulting Engineers on Miami Flood Prevention Plans.* (14) Aug. 8.
 Deep-Water Concreting Through a Tube; Notes on the Tremie Method and Suggestions of Various Expedients to Avoid the Difficulties Likely to be Encountered.* E. E. Van De Greyn. (14) Aug. 15.
 Paris Inundation Plans; Commission Recommends Enlargement of Arm of Seine at City Island and Deepening of Channel at Suresnes. Francis P. Mann. (14) Aug. 15.
 The Opening of the Cape Cod Canal.* (46) Aug. 15.
 Transportation of Débris by Water; Summary of Experiments Made to Determine the Laws Controlling the Carriage of Particles Moved Along the Stream Bed. (From Prof. Paper, U. S. Geol. Survey.) (14) Aug. 15.
 Design Features of the Commonwealth Pier No. 1, East Boston, Mass.* (86) Aug. 19.
 The Little River Drainage Improvements; Controlling Flood Waters by Detention Basins, Draining Low Ground. (14) Aug. 22.
 Revolving Cantilever Crane for Harbor Construction Work.* (13) Aug. 27.
 The Hydraulic Dredge *Niagara* and its Work in the Saginaw River.* (13) Aug. 27.
 Recent Improvements in the Wire Drag used by the United States Coast Survey; Its Possible Use as a War Machine.* (13) Aug. 27.
 Barge Canal Terminals.* J. A. O'Connor. (14) Aug. 29.
 Foundations for the Largest Ore-Shipping Dock in the World.* (14) Aug. 29.
 Riprapping with Weed Bundles.* (14) Aug. 29.
 Ueber den Ausbau des Hafens Corsini in Ravenna.* Karl Haller. (39) July 5.

*Illustrated.